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CRUSTACEA, DECAPODA & STOMATOPODA

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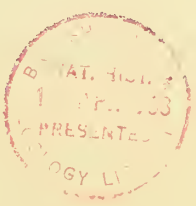

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INTRODUCTION

This report includes a total of 212 species accommodated in 123 genera. One new species is described and 49 new records are added to the Australian faunal list. No larger number of decapod and stomatopod Crustacea has hitherto been dealt with in a single work covering the marine fauna of the Great Barrier Reef waters of N.E. Australia. Another important fact is that the collection under review was taken in a limited area of central Barrier Reef waters between a point approximating Lizard Island off Lookout Point in the north, and Trinity Passage off Cairns in the south.

A substantial number of the recorded species were linked with the General Survey studies carried out in the environs of the Expedition headquarters, located at Low Isles for a 12-month period bridging the years 1928–29. This locality is an isolated coral reef and cay complex lying about eight miles to seaward of Port Douglas, North Queensland. While not all of the specimens originally labelled as General Survey received a mention in the published results of the Expedition's ecological work (see T. A. Stephenson and others, 1931), all are, without exception, faithfully recorded as such in the present report. Other specimens in the collection were obtained at various Expedition Stations where dredging and trawling operations were carried out. A large proportion of the balance consists mainly of the collections made during the Expedition by five members of the zoological staff of the Australian Museum, Sydney, one of whom was the present author. All the Museum zoologists were attached to the Expedition for periods of from two to three months.

The localities listed under specific headings are arranged in the order detailed above. In the matter of the distribution of species, care has been taken to provide the fullest possible data from all available literature. This has been done at the special request of the late Dr. T. A. Stephenson, leader of the Expedition's ecological studies.

In the following text, under the heading of each of the species named in the 1931 Ecological Report, a full quotation of that reference has been given. However, in a few cases, the 1931 published names have undergone change. The majority of these earlier published preliminary identifications were made by the present author; a few were obtained by T. A. Stephenson direct from the British Museum (Nat. Hist.).

Included in the General Survey data for many specimens, are symbols which indicate areas of the Low Isles environs on a Key Chart originally published in the Expedition's 1931 ecological report. Reference to this chart, republished in the present study (Fig. 1), will serve to indicate the habitats of the particular species concerned.

Regarding the species of *Thalamita* represented in the Expedition's collection, it was considered expedient for these to be first released for critical study and elaboration by Prof. W. Stephenson, University of Queensland, who, with his co-author, Miss J. Hudson, was carrying out research on Australian members of this genus. All specimens of *Thalamita*, including one species then described as new, are again recorded here with more locality detail than that given by Stephenson and Hudson in 1957. Another investigation undertaken by W. Stephenson was the quite recent resurvey of the marine ecology of Low Isles (1958, Stephenson, Endean and Bennett). With the exception of the portunids, all the other species of Decapoda listed in that report (1958) were identified by the present author. During the resurvey a few species were collected which were not represented in the original British Expedition collection, and these warrant inclusion in greater detail in this present study. A further inclusion aimed at bringing together the known decapods from the Expedition's collection, is the two already recorded species of *Lucifer* reported on earlier by Dr. Isabella Gordon in the present series (1956).

Apart from the studies on *Thalamita* and *Lucifer* already mentioned, and the few incidental references to other species listed in the following systematic text, Gurney (1937a, 1938, 1938a, and 1942) is the only other authority known to the author who has published results on Decapoda from the Expedition's Great Barrier Reef collections. With the exception of one post-larval stage, these studies deal only with unidentified or doubtfully identified larvae. For this reason no detailed listing of the material studied by Gurney will be attempted here. However, Barrier Reef Expedition material of the following groups was dealt with in these works: Alpheidae (1938); Hippolytidae – *Eretmocaris*, *Tozeuma* and *Latreutes* (1937a); Palaemonidae (1938, see also 1942:217 for one identified as *Leander tenuicornis*); Thalassinidae (1938a); Callianassidae – ?*Callianassa* (1938a); Upogebiidae – *Upogebia* (1938a); Laomediidae – ?*Naushonia* (1938a); Galatheidae (1942:255) and Dorippidae – ?*Dorippe* (1942:284). The single post-larval stage mentioned (Gurney, 1937a:399) was recorded as *Latreutes mucronatus* (Stimpson), but no substantiating details for this firm identification were given. *L. pygmaeus* was the only species of this genus recognized and recorded from the Expedition's material by the present author. The listing of "*Latreutes mucronatus?*" from the Low Isles area in Holthuis (1947:60) must refer to Gurney's queried determination for the larval, rather than the post-larval, specimen.

Careful consideration has been given to the selection of references to aid in the identification of the various species recorded. The opportunity has thus been taken here to build up a record of literature best suited for future workers on the Australian fauna, with specific accent on an Australian content. This practice has also obviated the need for extensive plate illustrations, which are considered in this case as unwarranted. The photographic reproductions that are included have been taken with special care so as to minimize distortion (plates I, II).

Two quite recently published works will be found to have a general bearing on the present report. While much of their contents deals with species not represented in the British Expedition's collection, their mention here will prove of value for Australian workers. The first, by A. A. Racek and W. Dall, is titled "Littoral Penaeinae (Crustacea Decapoda) from Northern Australia, New Guinea, and Adjacent Waters" (1965). Only three times is specific reference made to this work in the text of the present report, but no reference will be found to the second and equally important paper by the Japanese author, T. Sakai (1965, *The Crabs of Sagami Bay*; Maruzen Co., Tokyo; 206 pages of English text; 100 colour plates). In this last beautifully produced volume, there are many recordings of species represented in the British Expedition's collection which, with accompanying illustrations, largely duplicate references quoted here from another better known Sakai work (1936–1939) entitled "Studies on the Crabs of Japan" Parts I–IV.

The greatly increased total of known Decapoda in modern times has caused workers to confine their studies to sections and, in some cases, even families of the Order. Hence the examination of a large and varied collection like the present one tends to stretch the knowledge of a single author. In this regard it is regretted that a small number of specimens from the Expedition's collection still remain without identification. These are mainly small in size, and are representatives of the families Alpheidae (about 3 species), Paguridae (about 6 species), Pinnotheridae (2 species), Dromiidae (2 species), Xanthidae (about 5 species), Goneplacidae (about 5 species), Palicidae (1 species). As this present extensive and nearly complete report on the Expedition's very large collection has now been prepared, it is the author's earnest hope that some worker will be found to take up the task of determining the small balance of species involved.

In the lengthy study of the Expedition's collection no opportunity has been lost in seeking both the aid and advice of other specialists at home and abroad. Thus the grateful acknowledgement of the author is extended to J. S. Hynd, C.S.I.R.O. Division of Fisheries and Oceanography, N.S. Wales for much assistance with the identification and literature of the Caridea; to Miss Janet Haig, Allan Hancock Foundation, University of Southern California, whose valued assistance with the Porcellanidae made possible the correct recording of many species of that family, and who detected the novelty of the

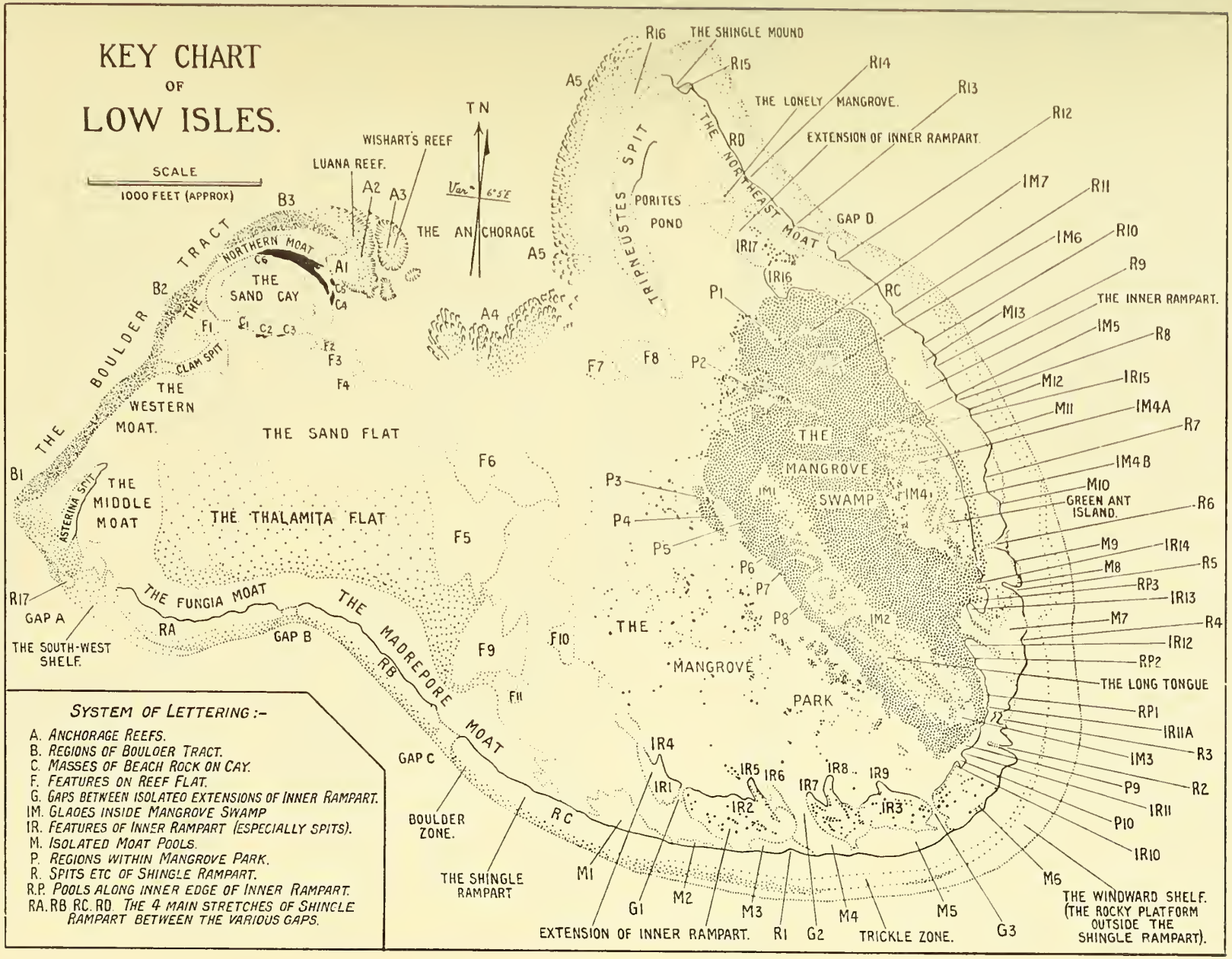

FIG. 1. Key chart of Low Isles, Great Barrier Reef. (After Stephenson, Stephenson, Tandy and Spender, 1931.)

specimen of *Polyonyx* described here as new; to Dr. A. H. Banner, Marine Laboratory, University of Hawaii, for identification of certain Alpheidae unknown to the author; to Dr. L. B. Holthuis, Rijksmuseum van Natuurlijke Historie, Leiden, who identified the two recorded species of Scyllaridae; to Dr. A. A. Racek, School of Biology, University of Sydney, for his advice and the checking of identifications of the recorded Penaeidae; and to Dr. Isabella Gordon, British Museum (Nat. Hist.), for organizing the loan of specimens required for re-examination, and on several occasions, informing the author of important name changes made by visiting specialists to that part of the Expedition's material already lodged in the British Museum. To a friend and co-author, Keith Gillett F.R.P.S. special thanks are due in acknowledgement of his technical help in the production of all but three of the photographs from which the plate illustrations have been prepared.

Finally, the author considers it a duty to record the encouragement and counsel he has received from Dr. J. C. Yaldwyn of the Australian Museum, whose interest and help has been an inspiration during the final stages of preparation of this report for publication.

LIST OF SPECIES INCLUDED IN REPORT

Species not recorded previously from Australian coastal waters are indicated with *. A † denotes additional species recorded from sources other than the British Great Barrier Reef Expedition collection.

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Order DECAPODA
Section PENAEIDEA
Family **PENAEIDAE**
Genus ***PARAPENAEOPSIS*** Alcock, 1901
Parapenaeopsis sculptilis (Heller)

Penaeopsis sculptilis: Alcock, 1906, p. 37, pl. vii, figs. 22, 22a-d (refs.).
Parapenaeopsis sculptilis: Boone, 1935, p. 80, pl. 20, and text fig. 4 (syn. & full refs.); Dall, 1957, pp. 217, 224, 225, 226, text fig. 27A-G (syn. & refs.).

LOCALITY: Stn. VII, Agassiz trawl; off Linden Bank, N. side of entrance Trinity Passage, E. of Cairns; 114 fms; 24.xi.1928 (1 small male, measuring 23 mm from rostral tip to end of cephalothorax).

DISTRIBUTION: Tropical Indo-west-Pacific region – ranges from Indian seas to China seas, Malay Archipel. and N.E. Australia.

REMARKS: The single example lacks limbs and the tip of its telson is missing. No terminal spinule could be found on the dorsum of the sixth somite; it is either missing or not developed. However, despite the generally damaged condition, there is no doubt about the identification, which fits very well Alcock's description of this variable species.

Genus ***PENAEUS*** Fabricius, 1798
Penaeus longistylus Kubo

Penaeus longistylis: Kubo, 1949, p. 282, text figs. 109, 110 (refs. *); Racek and Dall, 1965, p. 13, pl. 1, fig. 2 (syn. & refs.).
Penaeus caesius Dall, 1957, p. 142, 143, text fig. 2A-G; part = *P. latisulcatus* of Schmitt (not Kishinouye), 1926, p. 366 (only the female, Australian Museum Reg. No. E. 3157).

LOCALITIES: Low Isles; Sand Flat; shallow pools at low tide (4 juv. specimens – largest measuring 20 mm from tip of rostrum to end of carapace): shallow pool near Mangrove Swamp (1 juv. male, measuring 18 mm, as above).

DISTRIBUTION: Southern Japan, N.W. Australia, Torres Strait, N.E. Australia, and Lord Howe Is., S. Pacific.

REMARKS: Racek (1959, p. 11, footnote) claimed a new record from Australian waters for *P. longistylus*, based on material collected in the vicinity of North West Is., Capricorn Group, Queensland. In this same paper he suggested that future research might show that *P. caesius* Dall is a synonym. Racek and Dall (1965) have since agreed that the latter is definitely a synonym of *P. longistylis* Kubo.

Penaeus esculentus Haswell

Penaeus esculentus: Schmitt, 1926, p. 362, pl. lxiv, figs. 1-4 (syn. & refs.); Racek, 1955, p. 219, pl. 1, fig. 2, pl. 2, fig. 3, pl. 5, fig. 2, pl. 8, fig. 2 (syn. & refs.); Dall, 1957, p. 157, text fig. 7A-E (syn. & refs.).

LOCALITY: Off Low Isles; dredged, 9–12 fms; sand and mud bottom; 16.x.1928 (1 male, measuring 51·5 mm from tip of rostrum to end of cephalothorax).

DISTRIBUTION: Temperate and tropical E. Australian coast to Western Australia; Borneo (Kubo).

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*Kubo first published the name of his species in 1943. As this work is printed in Japanese, the author is unable to quote it here.

Genus *METAPENAEUS* Wood-Mason and Alcock, 1891
Metapenaeus endeavouri (Schmitt)

Penaeopsis endeavouri: Schmitt, 1926, p. 329, pl. lix, figs. 1-3, pl. lxviii, fig. 4.
Metapenaeus endeavouri: Dall, 1957, pp. 183, 187, text fig. 17A-F (syn. & refs.).

Localities: Low Isles; Sand Flat; shallow pools at low tide; hand-netted (2 very juvenile specimens): dredged off Low Isles; 9–12 fms; 17.x.1928 (1 juvenile female, measuring 19·5 mm from tip of rostrum to end of carapace).

Distribution: N.E. Australia.

Remarks: Although the specimens are juvenile, and one of them damaged and shrivelled, there is no doubt that they are correctly identified. All have been critically compared with the holotype and other examples of the species in the Australian Museum collection. The absence of a carina on the 4th abdominal somite of the two most juvenile specimens is due to their undeveloped stage of growth. These same two specimens have barely distinct areas of pubescence on the cephalothorax, and the absence of pubescence on their abdominal somites is again obviously due to lack of development. On the other hand, the largest of the three recorded specimens shows traces of pubescence on the anterior abdominal somites, and on the posterior somites its disposition compares with that of a fully adult form.

In the critical examination of the holotype and other specimens of the species named by Schmitt, it was discovered that his published figure lacks some detail in the spinulation of the telson. This part should show three pairs of spinules, all confined to the distal half of the telson. The last pair is elongated and may reach beyond the pointed tip of the telson.

Schmitt gives the range of rostral teeth as 10–12. The three juvenile specimens of the present series have a range of only 9–10 upper rostral teeth.

Genus *METAPENAEOPSIS* Bouvier, 1905
Metapenaeopsis palmensis (Haswell)

Penaeopsis novae-guineae: Schmitt, 1926, p. 338, pl. lxi, figs. 1, 2a, pl. lxviii, fig. 2a (part synonymy, and only figs. quoted here).
Metapenaeopsis palmensis: Racek and Dall, 1965, p. 23, pl. 4, figs. 3, 4, pl. 9, fig. 2, text fig. 2B (syn., refs., and species redefined).

Localities: Off Low Isles; Agassiz Trawl; 10–12 fms; 16.x.1928 (2 females; one being juvenile, carapace length excluding rostrum 8 mm, and the other with carapace length 16 mm).

Distribution: Eastern Malay Archipel., New Guinea, W., N., N.E. and E. Australia as far south as Sydney (Port Jackson), N.S. Wales.

Remarks: Racek and Dall (1965) have collaborated in a most able manner in bringing to notice much earlier confusion concerning the present species. Emerging from their research is the important restoration of *M. palmensis*, which had for many years been placed in the synonymy of *M. novae-guineae* (Haswell, 1879).

The present specimens, with their shallowly sulcate dorsal carina on the third abdominal segment and their 9–11 stridulating ridges, clearly belong to this restored species as redefined in the key given for the genus by Racek and Dall.

Metapenaeopsis rosea Racek and Dall

Metapenaeopsis rosea Racek and Dall, 1965, p. 29, pl. 1, fig. 4; pl. 4, figs. 7, 8, pl. 9, fig. 4, text figs. 2D, 3.

LOCALITIES: Stn. XIV, dredge; ½ mile S.E. of Lizard Is., off Lookout Point; 19 fms; 7.iii.1929 (1 juvenile female, carapace damaged): Stn. XIX, dredge; about ½ mile N. of Eagle Is., off Lookout Point; 10 fms.; 10.iii.1929 (1 damaged female, without rostrum and anterior margins of carapace; another associated female without carapace).

DISTRIBUTION: Tropical waters of N. and N.E. Australia.

REMARKS: The present record is the first recognition of this form since its recently published description as a new species. The Stn. XIV juvenile female, with its narrowly and deeply sulcated dorsal carina on the third abdominal segment, its 14 stridulating ridges and its moderately sized pterygostomian spine, falls easily within the definition of *M. rosea*. On the other hand, the two Stn. XIX females in their extensively damaged state agree only incompletely with this definition. They at least show the characteristic third abdominal sulcated carina, 16 stridulating ridges and a distinctive thelycum which, in the author's opinion, can not be associated with any other described species included by Racek and Dall in their key to Indo-West Pacific *Metapenaeopsis*.

It is of interest to note here that the two Stn. XIX specimens, when in the British Museum (N.H.) with the author's tentative identification of "*Penaeopsis novae-guineae*" (*fide* Schmitt, 1926), were examined by M. D. Burkenroad in 1938 and determined as "*Penaeopsis* (*Metapenaeopsis*) n. sp." (Isabella Gordon, *pers. com.*, 19.x.1963). It was only in 1965 that their apparently true relationship was at last made clear.

Genus *TRACHYPENAEUS* Alcock, 1901

Trachypenaeus granulosus (Haswell)

Penaeus granulosus Haswell, 1879, p. 41: 1882, p. 202 (part: female only).
Trachypenaeus granulosus: Schmitt, 1926, p. 351, pl. lxiii, figs. 1-2; Dall, 1957, pp. 203, 211, text fig. 25A-F (syn. & refs.). [Not the *T. granulosus* of other authors.]

LOCALITY: Stn. XXII, dredge; E. of Snake Reef, near Howick Is., between Lookout Point and Cape Melville; 13½ fms; 11.iii.1929 (1 specimen).

DISTRIBUTION: Torres Strait and N.E. Australia.

Genus *SICYONIA* H. M. Edwards, 1830

Sicyonia bispinosa de Haan

Sicyonia bispinosa de Haan, 1833-50 (part vi, 1849), p. 195, pl. xlv, fig. 9: de Man, 1911, p. 120 (ref.); 1913, pl. x, figs. 42-42c.

LOCALITY: Stn. XVII, dredge; about ¼ mile N. of N. Direction Is., off Lookout Point; 19 fms; 9.iii.1929 (1 specimen, overall measurement approx. 25 mm).

DISTRIBUTION: The limited recorded range of the species includes southern Japan, Malay Archipel., and N.E. Australia.

REMARKS: The present record extends considerably the known range of the species and constitutes the first reported occurrence from Australian coastal waters. A check of the reference collection of Decapoda in the Australian Museum has disclosed further specimens from Queensland waters which are referable to this same species. These are from Masthead Is., Capricorn Grp. (1 specimen; Reg. No. G.5780; coll. late F. E. Grant); and Bowen, Port Denison – hand-netted near jetty from amongst weed in shallow water at low tide (2 specimens; P.7062; coll. late E. H. Rainford).

Family *SERGESTIDAE*

Genus *LUCIFER* Vaughan Thompson 1829

Lucifer penicillifer Hansen

Lucifer penicillifer Hansen, 1919, p. 59, pl. v, figs. 2a-k: Gordon, 1956, p. 327, text figs. 4-6 (syn. & refs.).

LOCALITIES: Tow-netted at 48 Stations – area of Trinity Passage, east of Cairns; vicinity of Low Isles; areas farther northwards to beyond Lizard Island (hundreds of specimens – males, females, young and immature). Full details in Gordon's report; material not seen by present author.

DISTRIBUTION: Common in Malay Archipel. area explored by *Siboga* Expedition; also recorded from Bay of Bengal, China Sea, Formosa Strait, Manilla and Gulf of Yedo.

REMARKS: Gordon's report (1956) has provided the author with all data concerning this species.

Lucifer typus H. M. Edwards

Lucifer typus H. M. Edwards, 1837, p. 469: Gordon, 1956, p. 324, text figs. 1-3 (syn. & refs.).

LOCALITIES: Tow-netted at 16 Stations – Trinity Opening, east of Cairns and vicinity of Low Isles (62 specimens – males, females, young and immature). Full details in Gordon's report; material not seen by present author.

DISTRIBUTION: Common in warmer parts of Atlantic Ocean. Also recorded as rare in Bay of Bengal, and in Pacific Ocean from the Great Barrier Reef waters off north-eastern Australia to Manilla in the Philippine Islands.

REMARKS: Gordon's report (1956) has provided the author with all data concerning this species.

Section CARIDEA
Family ***ALPHEIDAE***
Genus ***ALPHEUS*** Fabricius, 1798

Alpheus ventrosus H. M. Edwards

Alpheus ventrosus: de Man, 1911a, pp. 311, 339 (syn. & refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 44, 73; Banner, 1956, p. 345 (syn. & refs.).
Crangon ventrosa: Banner, 1953, pp. 48, 49, 84, text fig. 28a-i (syn. & refs.).
Alpheus lottini: Barnard, 1950, p. 748, text fig. 141e-j (syn. & refs.).

LOCALITY: Low Isles; from branches of living coral; reef flat at low tide (13 specimens).

DISTRIBUTION: Throughout the entire tropical Indo-Pacific region, from E. Africa and Red Sea to the Gulf of California in Mexico.

REMARKS: The species was common at the locality. Specimens freshly preserved in alcohol had bodies of cream to yellowish hue; chelipeds were orange-yellow, often darker on their upper halves, where numerous reddish spots occurred.

Alpheus malleodigitus (Bate)

Alpheus malleodigitus: de Man, 1911a, pp. 313, 347 (syn. & refs.); 1915, pl. xiv, fig. 70.
[Not *A. malleodigitus* Coutière, 1899 = *A. microstylus* (Bate) – *fide* Banner, 1956, p. 346.]

LOCALITY: Ruby Reef, near Lizard Is., off Lookout Point; 6.vii.1929 (1 specimen).

DISTRIBUTION: The species appears to have previously been recorded with certainty only from the Fiji Islands (Bate) and Ternate, Moluccas Islands (de Man).

The present record is believed to be the first from the Australian coast.

Alpheus strenuus Dana

Alpheus strenuus: Coutière, 1905, p. 913, pl. lxxxvii, fig. 53 (ref.); de Man, 1911a, pp. 329, 425 (syn. & refs.); Barnard, 1950, p. 760 (syn. & refs.).
Crangon strenuus: Stephenson, Stephenson, Tandy and Spender, 1931, pp. 44, 73.
Crangon strenua: Banner, 1953, pp. 48, 141 (ref. & syn., discussion).

LOCALITIES: General Survey – Low Isles; the Mangrove Park; area P4 on published key chart; 17.iv.1929 (1 specimen): the extension of Inner Rampart; IR17 on published key chart; 22.iii.1929 (1 specimen): Stn. XIV, dredge; ½ mile S.E. of Lizard Is., off Lookout Point; 19 fms; 7.iii.1929 (1 specimen): Low Isles – reef flat at low tide; no specific habitat; 23.vi.1929 (2 specimens, with bopyrid parasites infesting branchiae): reef flat at low tide; no specific habitat for most of series (13 specimens – two of them taken from under the shell of a dead clam, *Tridacna*).

DISTRIBUTION: Ranges widely in tropical to temperate parts of the Indo-Pacific region – from Red Sea, E. Africa, Indian seas to Malay Archipel., E. Australia and W. Oceania.

REMARKS: A conspicuous spine on the lower distal end of the merus of the major cheliped readily distinguishes this species from its close allies.

Alpheus socialis Heller

Alpheus socialis: Thomson, 1903, p. 436, pl. xxvii, figs. 6-12 (refs.); Stebbing, 1904, p. 5 (Thomson's record discussed); de Man, 1911a, p. 311 (ref. & chars. in key).
Crangon socialis: Hale, 1927, p. 46, fig. 38.

LOCALITY: Low Isles – from among branches of dead coral, Madrepore Moat (12 specimens).

DISTRIBUTION: Records of the range appear to be restricted to a limited number of localities – N. Island of New Zealand; Sydney, N.S. Wales; N. Queensland coast; and S. Australia.

REMARKS: As far as is known, the present specimens are the first to be recognized from Queensland waters.

Alpheus bidens (Olivier)

Alpheus bidens: de Man, 1911a, pp. 318, 371 (syn. & refs.); 1915, pl. xvii, fig. 80.

LOCALITY: Stn. XVII, dredge; about ¼ mile N. of N. Direction Is., off Lookout Point; 19 fms; 9.iii.1929 (3 specimens).

DISTRIBUTION: Asiatic seas (H. M. Edwards); Amboina (Zehntner); Malay Archipel. – five localities (de Man); and N.E. Australia (present record).

The species has not previously been recorded from Australian waters.

Alpheus diadema Dana

Alpheus diadema: de Man, 1911a, p. 319.
Crangon diadema: Banner, 1953, pp. 51, 118, frontispiece and text figs. 43a-k (syn. & refs.).

LOCALITY: Low Isles; reef flat; no specific habitat (1 specimen).

DISTRIBUTION: Ranges throughout tropical Indo-Pacific region from Red Sea to Hawaiian Islands.

The species has not previously been recorded from Australian waters.

Alpheus frontalis (H. M. Edwards)

Alpheus frontalis: de Man, 1911a, pp. 318, 369 (syn. & refs.); 1915, pl. xvii, fig. 79.

LOCALITY: Stn. XVII, dredge; about ¼ mile N. of N. Direction Is., off Lookout Point; 19 fms; 9.iii.1929 (1 specimen).

DISTRIBUTION: Ranges widely in tropical Indo-Pacific region – Mauritius to Indian seas and China Sea, Malay Archipel., N.E. Australia and eastwards to Samoa and Tahiti.

REMARKS: The type locality of New Holland given by H. M. Edwards was the early general name for Australia. Apart from the present record there has apparently been no mention in literature of an additional occurrence of the species in Australian seas since it was originally described in 1837.

Alpheus gracilipes Stimpson

Alpheus gracilipes: de Man, 1887a, p. 500, pl. xxi, fig. 5 (refs.); 1911a, pp. 320, 380 (refs.).
Crangon gracilipes: Banner, 1953, pp. 51, 115, text figs. 41a-i (ref.).

LOCALITY: Low Isles; reef flat; from branches of dead coral growth (1 specimen): reef flat; no specific habitat (2 specimens).

DISTRIBUTION: Ranges widely in tropical Indo-Pacific region – E. Africa and Gulf of Aden to Indian seas, Malay Archipel., N.E. Australia, New Caledonia, and eastwards to Hawaiian Islands, Tahiti and Marquesas Islands.

The species has not previously been recognized from Australian coastal waters.

Alpheus parvirostris Dana

Alpheus parvirostris: de Man, 1911a, pp. 330, 432 (syn. & refs.); 1915, pl. xxiii, fig. 106.

LOCALITY: Low Isles; reef flat; sheltering in hole, underside of dead coral growth; 31.viii.1928 (2 specimens).

DISTRIBUTION: Ranges widely in warmer waters of Indo-Pacific region – from Red Sea to Indian seas and southern Japan, the Malay Archipel., N.E. Australia, New Caledonia, and eastwards to Samoa.

The species has not previously been recognized from Australian coastal waters.

Genus *SYNALPHEUS* Bate, 1888

Synalpheus coutièrei Banner

Synalpheus coutièrei Banner,* 1953, pp. 36, 37 (syn. & refs.); 1957, xi, 2, p. 195, text fig. 4 (syn. & refs.).

LOCALITY: Stn. XIX, dredge; about ½ mile N. of Eagle Is., off Lookout Point; 10 fms; 10.iii.1929 (1 specimen).

DISTRIBUTION: North-eastern Indian Ocean to Marshall Islands, and N.E. Australia.

The species is recognized here for the first time from Australian waters.

Synalpheus tumidomanus (Paulson)

Synalpheus tumidomanus: de Man, 1911a, pp. 196, 258 (syn. & refs.); 1915, pl. ix, fig. 43.

LOCALITY: Stn. XVI, dredge; about ½ mile W. of N. Direction Is., off Lookout Point; 20 fms; 9.iii.1929 (1 specimen).

DISTRIBUTION: Red Sea (Paulson); Singapore (Johnson, 1961); Malay Archipel. (de Man); and N.E. Australia (present record).

The species is recognized here for the first time from Australian waters.

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*Proposed for *S. biunguiculatus* Coutière, 1898, p. 232, figs. 1–4; not *S. biunguiculatus* (Stimpson), 1861, p. 31.

Synalpheus streptodactylus Coutière

Synalpheus neomeris, var. *streptodactylus:* Coutière, 1905, p. 870, pl. lxx, fig. 1.
[Not *S. streptodactylus:* de Man, 1911a, pp. 192, 226; 1915, pl. vii, fig. 29 = *S. metaneomeris* Coutière, 1921, p. 414, pl. 60, fig. 4 (syn. & refs.)].

Locality: Stn. XIX, dredge; about ½ mile N. of Eagle Is., off Lookout Point; 10 fms; 10.iii.1929 (1 specimen).

Distribution: Maldive Archipel., eastern Indian Ocean (Coutière). N.E. Australia (present record).

Remarks: As far as is known the species has not, until now, been reported upon since it was originally described. This record constitutes an addition to the Australian faunal list.

Genus *ATHANAS* Leach, 1814
Athanas indicus (Coutière)

Arete indicus Coutière, 1905, p. 863, text figs. 134, 135 (ref.): de Man, 1911a, p. 163 (chars. in key).
Athanas indicus: Banner and Banner, 1960, p. 149 (syn. & refs.).

Locality: Low Isles; reef flat; no specific habitat (2 specimens).

Distribution: Previously recorded from Persian Gulf; near Djibouti in Gulf of Aden; Maldive Archipel.; southern Japan; China; Marshall Islands; Indonesia; Aitutake in northern Cook Islands; and Bora Bora in the Society Islands.

The present record from N.E. Queensland appears to be the first recognition of the species in Australian coastal waters.

Family **PANDALIDAE**
Genus *HETEROCARPUS* A. M. Edwards, 1881
Subgenus *HETEROCARPOIDES* de Man, 1917
Heterocarpus (Heterocarpoides) levicarina (Bate)

Heterocarpus (*H.*) *levicarina:* de Man, 1920, pp. 110, 178, pl. xv, figs. 44-44f (syn. & refs.).

Locality: Stn. V, Agassiz trawl; Linden Bank, N. side seaward entrance of Trinity Passage, E. of Cairns; 37 fms; 24.xi.1928 (1 specimen).

Distribution: Recorded sparsely over a wide tropical Indo-west-Pacific range – Red Sea, Gulf of Martaban, Malay Archipel., Arafura Sea near Torres Strait, N.E. Australia.

The present record extends the known range of the species farther to the south and the east than Bate's Arafura Sea locality, and for the first time into Australian coastal waters.

Family **RHYNCHOCINETIDAE**
Genus *RHYNCHOCINETES* H. M. Edwards, 1837
Rhynchocinetes hendersoni Kemp

Rhynchocinetes hendersoni Kemp, 1925, p. 265, figs. 3-7 (syn. & refs.): Boone, 1935, p. 109, pls. 28, 29 (ref.); Holthuis, 1947, p. 80 (refs.).

Locality: Low Isles; the Madrepore Moat; from interstices in basal branches of dead growths (54 specimens; males and females).

DISTRIBUTION: Tropical Indo-west-Pacific region; ranging from Indian seas through Malay Archipel. to N.E. Australia, and Fiji. Despite that the species has been recorded only from a few localities, its occurrence as an inhabitant of coral growths appears to be widespread.

REMARKS: The present large series represents the first record of the species from Australian waters. Both sexes are included as well as a wide variation in size. Such extensive material is far in excess of all examples of the species previously recorded.

When the specimens were first examined their identity was somewhat doubted; unfortunately no articulation of the rostrum was detected at that time. The rather indefinite nature of this character was obviously overlooked by Boone, with whose figure (1935, Pl. 28) the specimens were considered to be in general agreement. To add to the present author's indecision it was found that Holthuis in 1947 accepted Boone's record as referable to *R. hendersoni*, but commented that her figure was incorrect in showing no articulation between rostrum and carapace. Kemp, of course, originally recorded an articulated rostrum for his *R. hendersoni*, and this character was later verified by Gordon (1936:82).

The author's thanks are due to Dr. Isabella Gordon for finally putting the identification beyond all doubt. She was prompted to make a critical examination of the specimens after their return to the British Museum, and has established that an articulation of the rostrum is definitely present, though by no means complete. She kindly returned to the Australian Museum six specimens of the species for reexamination by the present author. The articulated character of the rostrum was clearly visible in all these specimens, but did not approach, either in distinctness or in free movement, that of the allied and more familiar, eastern Australian *R. rugulosus*.

Rhynchocinetes rugulosus Stimpson

Rhynchocinetes rugulosus: McCulloch, 1909, p. 310, pl. 89, figs. 1-8 (refs.); Hale, 1941, pp. 269, 271, figs. 7a-e (refs.); Holthuis, 1947, pp. 77, 79 (syn. & full refs.).

[Not McCulloch, 1909, part (Lord Howe Is., S. Pacific record) = *R. balssi* Gordon, 1936; *vide* Hale, 1941, p. 270. Not Hale, 1927 (South Australia record) = *R. australis*; *vide* Hale, 1941, p. 270.]

LOCALITY: Stn. XVII, dredge; about $\frac{1}{4}$ mile N. of N. Direction Is., off Lookout Point; 19 fms; 9.iii.1929 (4 females).

DISTRIBUTION: On the evidence of literature the range of the species appears to be more restricted than earlier supposed. It will probably prove to be confined to Japan, Malay Archipel., and the tropical and temperate waters off the E. Australian coast.

REMARKS: The present specimens were submitted to the late H. M. Hale for critical examination. He stated that it is unfortunate the "series consists only of females, but the gill formula of these agrees with *rugulosus*." Previously the species has been accepted as a littoral form. It is, however, highly improbable that the present details of locality are incorrect.

In 1947 Holthuis recognized that confusion existed over this species when he stated that "a re-examination of the specimens cited in literature is needed . . . ". At the time he appears to have been unaware of Hale's published work (1941), in which this author described his own South Australian record of *R. rugulosus* as a new species (*R. australis*), and recognized McCulloch's specimens in the Australian Museum, recorded from Lord Howe Island, east of New South Wales, as *R. balssi* Gordon. At a later date, Holthuis (1952a, pp. 67, 68) enlarged upon his earlier statement concerning confusion among the species of *Rhynchocinetes* when dealing with *R. typus* and *R. balssi*.

Family **HIPPOLYTIDAE**

Genus ***SARON*** Thallwitz, 1891

Saron marmoratus (Olivier)

Saron gibberosus: de Man, 1902, p. 852, pl. xxvi, fig. 57 (syn. & refs.).

Spirontocaris marmorata: McNeill, 1926, p. 301, text fig. 1 (syn. & refs.).
Saron marmoratus: Barnard, 1950, p. 688, text figs. 128a-b (syn. & refs.).

LOCALITIES: General Survey – Low Isles; the Thalamita Flat; 21.iv.1929 (3 specimens): Low Isles; on reef flat generally and in the Madrepore Moat; common in last named among branches of dead growths (13 specimens – largest an ovig. female measuring 17 mm from tip of rostrum to end of cephalothorax): Yonge Reef, eastern edge of Great Barrier Reef in Lat. 14°35'S.; on reef crest; 5.vi.1929 (1 specimen).

DISTRIBUTION: Ranges widely in warmer waters of Indo-Pacific region (mainly tropical) – East Africa, Red Sea, Indian seas, southern Japan, Malay Archipel., Australia, and eastwards to Hawaii and Tahiti.

Genus ***THOR*** Kingsley, 1878
Thor paschalis (Heller)

Thor paschalis: Kemp, 1914, p. 94 (syn. & refs.); Holthuis, 1947, pp. 14, 49 (latest syn. & full refs.).

LOCALITY: Low Isles – reef at low tide (2 females, ovig.; one of them from basal branches of dead coral in Madrepore Moat).

DISTRIBUTION: Ranges widely in Indo-west-Pacific region – Red Sea, E. Africa, Andamans, Singapore, Malay Archipel. and N.E. Australia.

The present record extends the known range of the species much farther eastwards and is believed to be the first reported occurrence from Australian coastal waters.

Genus ***HIPPOLYSMATA*** Stimpson, 1860
Hippolysmata (Hippolysmata) vittata Stimpson

Hippolysmata vittata: Kemp, 1914, p. 113, pl. vi, figs. 6-10 (refs.); Barnard, 1950, p. 710, figs. 132a-c (syn. & refs.); 1955, p. 5.
Hippolysmata (H.) vittata: Holthuis, 1947, pp. 20, 67 (syn. & full refs.).

LOCALITY: Low Isles – from among branches of dead growths, Madrepore Moat (1 female, ovig.).

DISTRIBUTION: Ranges widely in Indo-west-Pacific region – Red Sea, Persian Gulf, E. Africa, Indian seas, Singapore, Siam, China, southern Japan, W. Australia, Malay Archipel., N.E. Australia.

The present specimen extends the known range of the species much farther eastwards, and the record is believed to be the first from eastern Australian waters.

Genus ***LATREUTES*** Stimpson, 1860
Latreutes pygmaeus Nobili

Latreutes pygmaeus: Kemp, 1914, p. 99, pl. iii, figs. 1-7 (refs.); Barnard, 1950, pp. 706, 707, fig. 131c (refs.); 1955, p. 5.

LOCALITY: Low Isles – shallow pool on reef flat at low tide (1 female, ovig.).

DISTRIBUTION: Ranges widely in Indo-west-Pacific region – Red Sea, Arabian coast, Indian seas, Singapore, N.W. and N.E. Australia.

The present record extends the known range of the species much farther eastwards and constitutes the first reported occurrence from eastern Australian waters.

REMARKS: The rostrum of the single specimen identified carries on its upper margin one spine near the tip and three evenly spaced spines on the distal half of the lower margin.

For reference to a post-larval stage taken in the Expedition's plankton collections off Low Isles and identified as *Latreutes mucronatus* (Stimpson) by Gurney (1937a), see the Introduction to this report.

Family **PALAEMONIDAE**
Subfamily **PALAEMONINAE**
Genus ***PALAEMON*** Weber, 1795
Palaemon (Palaemon) debilis Dana

Leander beauforti Roux, 1923, p. 18, figs. 1, 2.
Palaemon (P.) debilis: Holthuis, 1950, pp. 7, 66, figs. 13a-i (syn. & full refs.).

Localities: General Survey – Low Isles; Mangrove Swamp, in area IM1 on published key chart – a pool with more or less sandy bottom (2 specimens): Low Isles; hand-netted from shallow pools in and near the Mangrove Swamp (52 specimens).

Distribution: Recorded over a wide tropical Indo-Pacific range – Red Sea, E. Africa, western Indian Ocean, Malay Archipel., N.E. Australia, Hawaiian, Tuamotu and Ryukyu Islands.

Remarks: Roux's description of *L. beauforti* allows for variation in the number of rostral spines, a feature not uncommonly found in some species of the genus *Palaemon*. The present series of specimens is in excess of the total number of the species previously recorded, and has afforded the opportunity of presenting a marked range of variation in rostral spinulation. The formula is $\frac{4}{4}$ to $\frac{6}{6}$, with the majority of specimens $\frac{5}{6}$. These totals do not include the upper distal rostral spinule which is actually part of the bifid character of the tip. One specimen in the series is apparently abnormal; it has two spines crowded on to the rostral tip, giving only an obscure bifid effect.

The species has not previously been recorded from Australian waters.

Subfamily **PONTONIINAE**
Genus ***PARANCHISTUS*** Holthuis, 1952
Paranchistus biunguiculatus (Borradaile)

Anchistus biunguiculatus Borradaile, 1898, p. 387.
Paranchistus biunguiculatus: Holthuis, 1952, pp. 13, 93, figs. 36a-f, figs. 37a-g, figs. 38a-b (syn. & full refs.).

Locality: Undine Reef, off Cape Tribulation; 8.vii.1929 (1 specimen, commensal in the giant clam, *Tridacna gigas* (= *T. derasa* of earlier Great Barrier Reef Expd. reports).

Distribution: Apparently known only from Palau Islands, Moluccas, New Guinea, and N.E. Australia.

The present record constitutes the first recognition of the species from Australian coastal waters.

Genus ***ANCHISTUS*** Borradaile, 1898
Anchistus custos (Forskål)

Harpilius inermis Miers, 1884, p. 291, pl. xxxii, fig. B.
Anchistus inermis: Kemp, 1922, p. 249, figs. 81a-d (syn. & refs.); Barnard, 1950, p. 792, text figs. 150a-d (syn. & refs.).
Anchistus custos: Holthuis, 1952, pp. 13, 105, text figs. 43a-e; 44a-b (syn. & full refs.).

Locality: Low Isles – reef flat at low tide; 26.vii.1928 (1 specimen, from mantle cavity of razor shell, *Pinna*).

Distribution: Tropical to temperate Indo-west-Pacific region, from Red Sea, Persian Gulf and E. African coast to Indian seas, Malay Archipel., Palau, W. and S. Australia, N.E. Australia, Santa Cruz Islands and south-eastwards to Fiji.

Genus *CONCHODYTES* Peters, 1852
Conchodytes tridacnae Peters

Pontonia meleagrinae: Bate, 1888, p. 707, pl. cxxiv, figs. 1-2 (refs.).
Conchodytes meleagrinae: Barnard, 1950, p. 801, figs. 151n, o (syn. & refs.).
Conchodytes tridacnae: Holthuis, 1952, pp. 17, 195, fig. 95 (syn. & full refs.).

Localities: Low Isles – reef flat at low tide; 17.ix.1928 and 12.xi.1928 (3 specimens, from mantle cavities of Black-lip Pearl Oysters, *Pinctada margaritifera*): Batt Reef, near Low Isles – low tide; 29.x.1928 (4 specimens; host not recorded but, without doubt, the same as above).

Distribution: Throughout the Indo-west-Pacific region from Red Sea and E. African coast to south of Japan, the Malay Archipelago, N.W. and N.E. Australia, and Oceania as far east as Hawaii.

Genus *PERICLIMENES* Costa, 1844
Subgenus *HARPILIUS* Dana, 1852
Periclimenes (Harpilius) elegans (Paulson)

Periclimenes (Ancyclocaris) elegans: Kemp, 1922, figs. 60-62; var. *dubius*, p. 218, fig. 63 (syn. & refs.); Variety *dubius* McNeill, 1926, p. 300 (syn. & refs.).
Periclimenes (Harpilius) elegans: Holthuis, 1952, pp. 11, 81, fig. 31 (syn. & refs.).

Localities: General Survey – Low Isles; Madrepore Moat; 21.iv.1929) 1 ovig. female): from *Pocillopora* coral, reef flat (1 specimen): Low Isles – without specific habitat (1 specimen): Batt Reef, near Low Isles; 29.x.1928 (2 specimens; one an abnormal female).

Distribution: Red Sea, Persian Gulf, Bay of Bengal, Malay Archipel., Queensland.

Remarks: Several of the specimens exhibit the characters given varietal status by Kemp but since discredited by Holthuis.

Periclimenes (Harpilius) brevicarpalis (Schenkel)

Periclimenes (Ancylocaris) brevicarpalis: Kemp, 1922, p. 185, pl. vi, fig. 8 (syn. & refs.); McCulloch and McNeill, 1923, p. 58, fig. 2 (syn. & refs.).
Periclimenes brevicarpalis: Stephenson, Stephenson, Tandy and Spender, 1931, pp. 47, 73.
Periclimenes (Harpilius) brevicarpalis: Holthuis, 1952, pp. 10, 69, text fig. 27 (syn. & full refs.).

Localities: General Survey – Low Isles; Western Moat; 18.iv.1929; from the anemone, *Actineria dendrophora* (1 specimen): from the anemone, *Stoichactis kenti;* 30.vii.1928 (1 specimen): Low Isles; commensal on *Stoichactis;* reef flat; 26.viii.1928 (4 specimens): reef flat; commensal on *Actinodendron;* 10.viii.1928 (2 specimens).

Distribution: Indo-west-Pacific region generally, from Red Sea and S.E. Africa to Ryukyu Islands, Malay Archipel., Queensland and Oceania.

Remarks: Mature females are readily recognized by the prominently dilated condition of the branchiostegal regions.

Periclimenes (Harpilius) rotumanus Borradaile

Periclimenes rotumanus Borradaile, 1899, p. 1005, pl. lxiv, figs. 5, 5a-b (ref.).
Periclimenes (Ancyclocaris) rotumanus: Kemp, 1922, pp. 172, 226 (refs.).
Periclimenes (Harpilius) rotumanus: Holthuis, 1952, p. 12 (refs.).
[Not *P. rotumanus:* Nobili, 1899 (Beagle Bay, New Guinea record) = *P. (H.) proximus* Kemp, 1922, p. 201; *fide* Holthuis, 1952, p. 12.]

LOCALITY: Low Isles – from among branches of dead growths, Madrepore Moat (1 specimen).

DISTRIBUTION: The only known records appear to be from Rotuma, Samoa (type locality), in S. Pacific; and Low Isles, N.E. Australia (present recording).

The present specimen is believed to be the first of its species to be recorded from Australian waters.

REMARKS: On the rostrum are seven dorsal teeth of equal size instead of the total of six noted in Kemp's key, and an additional microscopic dorsal tooth almost at the tip. This type of variation is to be expected in the genus and, despite it, other important characters were found to fit readily into Kemp's comprehensive key.

Periclimenes (Harpilius) spiniferus de Man

Periclimenes (*Ancyclocaris*) *spiniferus:* Kemp, 1922, p. 195 (syn. & refs.); McNeill, 1926, p. 300 (syn. & refs.).
Periclimenes spiniferus: Stephenson, Stephenson, Tandy and Spender, 1931, p. 47.
Periclimenes (*Harpilius*) *spiniferus:* Holthuis, 1952, pp. 12, 76, fig. 30 (syn. & refs.).

LOCALITIES: General Survey – Low Isles; Western Moat, from coral crevices (2 specimens): Low Isles; from coral growths; coll. G. W. Otter (2 specimens): reef flat, from coral growth (1 specimen); Madrepore Moat, from among branches of dead growths (24 specimens).

DISTRIBUTION: Indo-west-Pacific, from Seychelles and Madagascar to the Malay Archipel., Queensland and Oceania.

Genus ***CORALLIOCARIS*** Stimpson, 1860
Coralliocaris graminea (Dana)

Coralliocaris graminea: Kemp, 1922, p. 269, text figs. 96, 97 (syn. & refs.); Boone, 1935, p. 176, pl. 48 (syn. & refs.); Gurney, 1938, p. 20, text figs. 81-89 (larval stages); Holthuis, 1952, pp. 17, 186, text fig. 91 (syn. & full refs.).

LOCALITY: Low Isles – the Western Moat (2 specimens); the Middle Moat – label stated incorrectly "South-western Moat" – 15.x.1928 (1 specimen); the Madrepore Moat, from interstices of dead growth; Oct. 1928 (6 specimens).

DISTRIBUTION: Throughout warmer seas of the Indo-west-Pacific region, from the Red Sea and E. Africa to China, southern Japan, Australia and Oceania.

REMARKS: In life the species is a uniform deep green colour, and is found in association with living and dead branched corals.

Family **PROCESSIDAE**
Genus ***NIKOIDES*** Paulson, 1875
Nikoides danae Paulson

Nikoides sibogae de Man, 1920, p. 193, pl. xvi, figs. 50-50j (ref.).
Nikoides danae: Gurney, 1937, pp. 89, 91, pl. I, figs. 20-25; pl. II, figs. 26-29; pl. IV, fig. 41 (syn. & refs.); Barnard, 1955, p. 44 (refs.); Holthuis, 1955, p. 117 (ref.).

LOCALITY: Stn. XVI, dredge; about ½ mile W. of N. Direction Is., off Lookout Point; 20 fms; 9.iii.1929 (2 specimens).

DISTRIBUTION: Occurs over a wide tropical Indo-west-Pacific range, but collected material is scanty – Red Sea, E. Africa, Malay Archipel. (several locations), N.E. Australia.

The present specimens are the first of the species to be recognized from Australian waters.

REMARKS: Gurney (1937) has discussed the synonymy of *N. sibogae* with the present species. The very full case he has presented has been closely studied and appeals as most conclusive.

Section STENOPODIDEA
Family **STENOPODIDAE**
Genus ***STENOPUS*** Latreille, 1819
Stenopus hispidus (Olivier)

Stenopus hispidus: McNeill and Ward, 1930, p. 360 (refs.); Holthuis, 1946, p. 12, pl. I, figs. a-g (syn. & full refs.); Barnard, 1950, p. 578, text fig. 106 (refs.).

LOCALITY: General Survey – Low Isles; Anchorage Reefs; area A4 on published key chart; 24.iv.1929 (1 specimen): Low Isles; shallow water on reef flat, clinging to underside of flat conglomerate boulder (1 specimen).

DISTRIBUTION: Known from almost the entire Indo-Pacific region, and from the tropical east American seas. But it does sometimes penetrate temperate waters such as the southern section of the eastern Australian coast (see also Yaldwyn, 1964, p. 286, figs. for records from Sydney, N.S.W.).

Genus ***MICROPROSTHEMA*** Stimpson, 1860
Microprosthema validum Stimpson

Stenopus robustus Borradaile, 1910, p. 260, pl. 16, fig. 4: McNeill and Ward, 1930, p. 361 (refs.).
Microprosthema validum: Holthuis, 1946, p. 50, pl. iii, fig. h (syn. & full refs.).

LOCALITY: Low Isles; from underside of a conglomerate boulder on the reef flat, in shallow water (1 specimen).

DISTRIBUTION: Occurs throughout the warmer waters of the Indo-west-Pacific region, reaching as far north as southern Japan and as far south as Port Jackson in N.S. Wales.

Genus ***ODONTOZONA*** Holthuis, 1946
Odontozona sculpticaudata Holthuis

Odontozona sculpticaudata Holthuis, 1946, p. 37, pl. 3, fig. f; pl. iv, fig. c.

LOCALITY: Low Isles; no specific habitat; 16.viii.1954 (1 female); an additional record from the locality subsequent to the British Great Barrier Reef Expd. of 1928-29.

DISTRIBUTION: Sape Strait, E. of Soembawa, Malay Archipel.; *Siboga* Expd. (Holthuis). N.E. Australia (present record).

REMARKS: The single example of this small species is a perfect one, and has been identified by Dr. Holthuis as the first of its kind to be recognized since he published his description of another female (holotype) in a considerably damaged condition. It was first noted as a novelty in the collection made by Stephenson, Endean and Bennett (1958) while engaged in their ecological field survey of the locality, but its name was not later listed in the published results of their work.

The present author had the privilege of examining and naming for Prof. Stephenson the majority of his expedition's 1954 Low Isles Decapoda but, at the time, was unable to place the specimen in question anywhere other than in its family grouping. It was after this that Dr. Holthuis's help was sought.

The present record considerably extends the range of the species, and constitutes a new addition to the Australian decapod fauna.

At the time of completion of the above notes the Low Isles specimen was still in Dr. Holthuis's care, as he had expressed a desire to redescribe the species.

Section PALINURA
Family **SCYLLARIDAE**
Genus ***THENUS*** Leach, 1815
Thenus orientalis (Lund)

Thenus orientalis: Holthuis, 1946, p. 106 (syn. & full refs.); Barnard, 1950, p. 565, fig. 104e (refs.).

LOCALITIES: Stn. VIII, Agassiz trawl; 1½ miles N.W. of Low Isles; 11 fms; 21.ii.1929 (1 specimen): off Low Isles, dredge; 12 fms; sand and mud bottom; 16.x.1928 (1 specimen).

DISTRIBUTION: Indo-west-Pacific region generally. Ranges from Red Sea and E. coast of Africa, through Indian seas to China, southern Japan, Malay Archipel., W., N. and N.E. Australia.

Genus ***SCYLLARUS*** Fabricius, 1775
Scyllarus martensii Pfeffer

Scyllarus martensii: Holthuis, 1946, p. 96 (syn. & refs.); Barnard, 1950, pp. 557, 558, text fig. 104b (syn. & refs.).

LOCALITY: Stn. XIV, dredge; ½ mile S.E. of Lizard Is., off Lookout Point; 19 fms; 7.iii.1929 (1 specimen; overall measurement 17 mm).

DISTRIBUTION: Widely distributed in Indo-west-Pacific – from E. and S. Africa to southern Japan, Malay Archipel., N.E. Australia, and Hawaii.

The species has apparently not previously been recorded from Australian waters.

Scyllarus gibberosus (de Man)

Scyllarus gibberosus: de Man, 1916, pp. 70, 71, 90, pl. iii, figs. 14-14d (syn. & ref.).

LOCALITY: Stn. XVII, dredge; about ¼ mile N. of N. Direction Is., off Lookout Point; 19 fms; 9.iii.1929 (1 specimen; overall measurement 49·5 mm).

DISTRIBUTION: Ranges widely in tropical Indo-west-Pacific region – from Red Sea to Malay Archipel., and N.E. Australia.

The species has apparently not previously been recorded from Australian waters.

Family **PALINURIDAE**
Genus ***PANULIRUS*** White, 1847
Panulirus versicolor (Latreille)

Palinurus fasciatus: de Haan (1833-1850), pt. *v* 1841, p. 159, pl. 43/44, fig. 2 (ref.).
Panulirus versicolor: de Man, 1902, p. 760 (syn. & refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 67, 73; Holthuis, 1946, pp. 141, 142, pl. vii, fig. j; pl. ix, fig. b; pl. xi, figs. e, f, m (full syn. & refs.).

LOCALITY: Low Isles; coral beds in shallow water beyond edge of surrounding reef (number of specimens observed during diving operations).

DISTRIBUTION: Ranges widely in warmer waters of Indo-Pacific region – S. Africa, Madagascar and Persian Gulf to southern Japan, Malay Archipel., N.E. Australia, New Caledonia, Solomon Is., and eastwards to Tahiti.

REMARKS: While no specimen of this species were preserved, the identification is a positive one. Notes made at the time of observation refer to the characteristic transverse striping of the abdomen and the longitudinal lines on the limbs. A subsequent verification of the occurrence of the species in Queensland waters was obtained by the author from Dr. R. George of the Western Australian Museum, who has made a special study of the family Palinuridae. A letter received from him states that he speared three specimens at Heron Island, Capricorn Group, in May, 1961.

Section THALASSINIDEA
Family **THALASSINIDAE**
Genus ***THALASSINA*** Latreille, 1806
Thalassina anomala (Herbst)

Thalassina anomala: de Man, 1888, p. 261 (syn. & refs.); 1928, pp. 4, 5, 14 (syn. & refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 40, 42.

LOCALITY: General Survey – Low Isles; the Mangrove Swamp, in mud burrow (1 specimen).

DISTRIBUTION: Tropical Indo-Pacific region; from Mergui Archipel. and Nicobars to Philippines, Ryukyu Islands, Malay Archipel., N. and N.E. Australia, Fiji.

Family **CALLIANASSIDAE**
Genus ***CALLIANASSA*** Leach, 1814
Subgenus ***CHERAMUS*** Bate, 1888
Callianassa (Cheramus) joculatrix de Man

Callianassa (*C.*) *joculatrix* de Man, 1928, pp. 98, 130, pl. xii, figs. 19, 19b, 19c, pl. xiii, figs. 19a, 19d-19m (ref.).

LOCALITY: ¾ mile S.E. from Low Isles; Agassiz trawl; 13 fms; mud (7 specimens).

DISTRIBUTION: The limited known range of the species appears to include only Malay Archipel. and N.E. Australia.

REMARKS: Apart from four detached major chelae, there is an absence of limbs from the series of this small species. Despite this deficiency, however, there is little doubt that the specimens are correctly identified. The only other form with which de Man's species could be confused is *C.* (*C.*) *orientalis* (Bate), from the Arafura Sea, north of Australia; de Man (1928) has recorded some comparisons.

The present record extends considerably the known range of the species and constitutes the first reported occurrence in Australian coastal waters.

Subgenus ***TRYPAEA*** Dana, 1952
Callianassa (Trypaea) australiensis (Dana)

Trypaea australiensis Dana, 1852, p. 513; 1855, pl. xxxii, figs. 4a-c: Fulton and Grant, 1906, p. 14 (syn. & refs.).
Callianassa (*Trypaea*) *australiensis:* de Man, 1928, pp. 27, 93, 104, 134 (ref. & chars. in key); Hailstone and Stephenson, 1961, pp. 259-285, pls. 1-3, text figs. 1-15 (refs. and full discussion).
Callianassa australiensis: Stephenson, Stephenson, Tandy and Spender, 1931, p. 56.

LOCALITY: General Survey – Low Isles; dug from sand at low tide in the Mangrove Park; 18.iv.1929 (4 specimens).

DISTRIBUTION: N.E. coast to S.E. coast of Australia.

REMARKS: The species lives below the surface in either clean or muddy sand, and is particularly abundant in the shallows covering the tidal flats of many estuaries and coastal lakes. Examples from the cooler southern waters are larger and more robust than those from tropical parts, and exhibit subtle variation.

Section PAGURIDEA
Family **PAGURIDAE**
Genus ***DIOGENES*** Dana, 1852
Diogenes sp.

Diogenes sp. Stephenson, Endean and Bennett, 1958, pp. 269, 292, 300.

LOCALITY: Low Isles; no recorded habitat (2 specimens); an additional record from the locality subsequent to the British Great Barrier Reef Expd. of 1928-29.

REMARKS: A small species which the present author was unable specifically to identify. As the specimens secured were definitely referable to the genus *Diogenes*, it has been considered of value to add the record to the known Decapoda occurring at the locality.

Genus ***CALCINUS*** Dana, 1852
Calcinus gaimardii (H. M. Edwards)

Calcinus gaimardii: de Man, 1902, p. 740 (syn. & refs.); Alcock, 1905, pp. 53, 56 (syn. & refs.); Barnard, 1950, p. 439 (refs.); Fize and Serène, 1955, pp. 40, 49, pl. II, figs. 5-8; text figs. 7, A, B, B1, C, 8A-C (syn., full refs., descr.).

LOCALITIES: General Survey – Low Isles; the Boulder Tract; area B2 on published key chart (1 specimen): Low Isles; the Inner Rampart, under a boulder (1 specimen). Yonge Reef, eastern edge of Great Barrier Reef, in Lat. 14°35′S.; from reef crest; 5.vi.1929 (2 specimens).

DISTRIBUTION: Ranges widely in Indo-Pacific, mainly in tropical region – E. Africa, Indian seas to East China Sea, Viet-Nam, Malay Archipel., Australia, and generally eastwards to Fiji and Tahiti.

Calcinus herbstii de Man

Calcinus herbstii: Alcock, 1905, p. 53, pl. v, figs. 4, 4a (syn. & refs.); Boone, 1935, p. 20, pl. 2 (syn. & full refs.); Forest, 1951, pp. 89, 90, text figs. 2, 5-6, 9 (ref.); Fize and Serène, 1955, pp. 40-41, pl. II, figs. 1-4; text figs. 6A-C (syn., full refs., descr.).
Calcinus laevimanus: Barnard, 1950, p. 437, text figs. 80 e-f (syn. & refs.).

LOCALITIES: Low Isles; region of the Inner Rampart, in S.W. quarter of reef system; under conglomerate boulders (6 specimens). Snapper Is., near Low Isles; rocky reef at low tide (1 specimen). Three Isles, N. of Cape Bedford; May 1929 (1 specimen).

DISTRIBUTION: Ranges widely in Indo-Pacific, mainly in tropical region – E. Africa, Indian seas to southern Japan, Malay Archipel., Australia, and generally eastwards to Hawaii, Tuamotu Archipel. and Tahiti.

Calcinus latens (Randall)

Calcinus latens: Alcock, 1905, pp. 53, 58, pl. v, fig. 5 (syn. & refs.); Grant and McCulloch, 1906, p. 34 (syn. & refs.); Barnard, 1950, pp. 437, 438 (refs.); Forest, 1951, pp. 94, 96, text figs. 14-18 (ref.); Fize and Serène, 1955, pp. 40, 58, pl. II, figs. 9-11, text figs. 9A-C (syn., full refs., descr.).

LOCALITIES: Low Isles; region of the Inner Rampart, in S.W. quarter of reef system; under conglomerate boulder (1 specimen). Batt Reef, near Low Isles; under boulders (6 specimens).

DISTRIBUTION: Ranges widely in Indo-Pacific, mainly in tropical region – East Africa, Red Sea, Indian seas to East China Sea, Viet-Nam, Malay Archipel., Australia, and generally eastwards to Hawaii and Tahiti.

Genus *CLIBANARIUS* Dana, 1852

Clibanarius virescens (Krauss)

Clibanarius virescens: McCulloch, 1913, pp. 346, 351, pl. xi, fig. 2 (syn. & full refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 37, 44, 59, 61; Barnard, 1950, pp. 433, 435, text figs. 80 b, c (syn. & full refs.); Fize and Serène, 1955, pp. 77, 138, text figs. 21A-C (syn., full refs., descr.).

Localities: General Survey – Low Isles; reef flat at low tide; coral rock bottom; in areas marked F8 and F9 on published key chart; 4.iv.1929 (17 specimens): the Boulder Tract; area B2 on published key chart (2 specimens): Shingle Rampart; area RC on published key chart; 8.iii.1929 (3 specimens): Extension of Inner Rampart; area marked IR17 on published key chart; 22.iii.1929 (1 specimen): Batt Reef, near Low Isles; low tide, Nov. 1928 (1 specimen): Snapper Is., near Low Isles; fringing reef flat at low tide (20 specimens): Three Isles N. of Cape Bedford; reef at low tide; 5.v.1929 (3 specimens); May 1929 (9 specimens).

Distribution: Ranges widely in Indo-Pacific region – E. Africa and Red Sea, eastwards to Mergui Archipel., northwards as far as Hongkong, eastwards through Malay Archipel., the tropical and temperate coasts of Australia, New Caledonia, Lord Howe Is. in the South Pacific, and Fiji.

Remarks: The species is the most conspicuously common hermit crab of the tropical Australian coasts. On every coral reef flat, and in favourable localities along the coastal rocky reefs, specimens shelter at low tide in thousands under slabs and boulders, occupying a variety of gastropod shells.

There are a number of examples in the Australian Museum collection from localities along the temperate N.S. Wales coast (E. Australia) to a point as far south as Port Jackson.

Clibanarius striolatus Dana

Clibanarius striolatus Dana, 1852, p. 463, pl. xxix, figs. 3a-3c: McCulloch, 1913, pp. 348, 352 (refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 38, 40, 41, 42; Fize and Serène, 1955, pp. 76, 97, pl. III, fig. 4, text figs. 13A-C (syn., full refs., descr.).

Clibanarius padavensis de Man, 1888, p. 242, pl. 16, figs. 1-5: Alcock, 1905, p. 44, pl. iv, fig. 2 (refs.); McCulloch, 1918, p. 290 (ref.; record only).

Localities: General Survey – Low Isles; the Mangrove Swamp; in open areas indicated by symbols IM1, IM4 and IM5 on published key chart; 5.iv.1929 (3 specimens): Low Isles; the Mangrove Swamp and the Mangrove Park; found commonly occupying shells of the mangrove whelk, *Telescopium* (13 specimens; largest a female measuring 24·5 mm from tip of rostrum to end of carapace).

Distribution: Ranges widely in Indo-Pacific region – from E. Africa and Madagascar to Gulf of Aden, Persian Gulf, coasts of India, Seychelle and Nicobar Islands, to southern Japan, Malay Archipel., tropical Australia, and eastwards to Tahiti.

Colour note: The species was found to be common at the locality. In the largest examples of the series the limbs were noticeably darker in colour, and the longitudinal stripes on the meral joints more indefinite than in the smaller examples. Also in these the red striping (pigmented streaks) running the length of the eyestalk was most conspicuous, but this was absent in the larger examples.

Synonymy: The range in size, and the variation in colouring and spinulation of the Low Isles series of specimens, has provided an opportunity for critical assessment of true specific identification. After a study of the records in literature the impression is gathered that workers have tended to perpetuate de Man's species. In fact, there is a preponderance of published records of that author's *C. padavensis* over the older *C. striolatus* Dana. Another significant point is that the same type of habitat and the same wide distribution are claimed for both species. The two have been claimed to occur together at one and the same locality, and Kemp (1915, p. 250) records *C. padavensis* as occupying shells of *Telescopium*. On the evidence available it is firmly believed that future study of large series of specimens from numerous points along the extensive range of occurrence will support the present belief that *C. padavensis* is a synonym of *C. striolatus*. This action has been taken despite the knowledge

that de Man was aware of Dana's *C. striolatus* (see de Man, 1887, p. 445) when he compared it with his "*Clibanarius* sp." (de Man, 1888, p. 241). It is considered, however, that the subsequent accumulation of knowledge and the greater abundance of material now recorded provides a clearer picture of the status of *C. padavensis*. It also indicates that the characters used by de Man to separate his species from *C. striolatus* can now be considered of lesser importance than he believed them to be.

A critical examination of the present Low Isles specimens and the extensive additional material in the Australian Museum collection from tropical Australia, New Guinea, Solomons and New Caledonia shows a range of characters covering those claimed in the original descriptions and figures of both Dana's and de Man's species.

In reviewing the literature, it is very evident that Alcock (1905, p. 46, pl. iv, fig. 7) caused early confusion with his illustration of a hermit crab claimed to be *C. striolatus* Dana, which differs greatly from the original figure of that species (Dana, 1852). The character of the anterior margin of the carapace alone would dispose of Alcock's claim, and the list of characters he gives for the separation of *C. striolatus* from *C. padavensis* are considered unsubstantial. No suggestion can be given of the true identity of the species figured by Alcock, but it is certainly not the same as the *C. striolatus* figured by Dana.

Haswell (1882, p. 159) used the name *C. striolatus* Dana for a record of a specimen from Holborn Is., Queensland, stating that it agreed "tolerably well" with "the description and figure of *C. striolatus*", but commented upon some variation in the spines of the hand and carpus, and also of the ophthalmic scale. A series as large as the one at present available to the author might well have convinced Haswell that *C. striolatus* varies in respect to size and spinulation of the chelipeds and in the shape and length of the ophthalmic scale.

Barnard (1950, pp. 433, 434) obviously followed Alcock in his differentiation of the two species, which he states were collected together at the same locality in E. Africa. If the specimens Barnard determined as *C. striolatus* agree in every detail with the figure given by Alcock (1905), they must be incorrectly determined. Another author, Yap-Chiongee (1938, pp. 192, 193, pl. 1, figs. 1 and 5) has attempted to differentiate between the species *C. striolatus* and *C. padavensis*. He lists comparative characters which are considered unconvincing, and his poor figures (photographic reproductions) are too small to be of any worthwhile value.

Some strong evidence suggesting doubt as to the true identity of the two species is shown in the case of the two Western Australian records by McCulloch (1913 and 1918). The first is a specimen from Kollan Is., King Sound, which he listed as *C. padavensis;* and the second a specimen, with only the abdomen damaged, from the general locality of Western Australia, which was listed as either *C. striolatus* or *C. padavensis*. These specimens are in the Australian Museum collection, and have been critically examined by the author, who considers them to be correctly referable to *C. striolatus*

Fize and Serène (1955) have published the most recent study of the two species under discussion. Their description of the Viet-Nam material they identify as *C. striolatus* is a long and exhaustive one, and demonstrates a considerable knowledge of the relevant literature. They have included in their description some detailed comparison with *C. padavensis*, mainly based on specimens identified as that species in the Indian Museum, Calcutta. Much emphasis is placed by them on spinulation of chelipeds and pigmented streaks or striping of eyestalks, but these characters do not agree with the present author's findings, as recorded above. It seems that only an examination of the type specimens involved and, as already suggested, a study of extensive material along the length of the zoogeographic range of both species in question, will provide the final solution of their true identity.

Joan Gordan (1956) gives a bibliography of pagurid crabs, exclusive of Alcock (1905). On p. 310 there is listed what is claimed to be full references to the two specific names under discussion. A study of locality records given by the various authors quoted should substantially support the arguments used here concerning synonymy.

Clibanarius taeniatus (H. M. Edwards)

Pagurus taeniatus H. M. Edwards, 1848, p. 63.
Clibanarius taeniatus: McCulloch, 1913, pp. 349, 352, pl. xi, fig. 1 (syn. & full refs.); Ward, 1937, p. 38 (record only).

LOCALITY: Low Isles; under conglomerate boulders on the Inner Rampart and in the Mangrove Park (4 specimens).

DISTRIBUTION: Appears to be almost entirely confined to Australian waters, ranging from Sharks Bay, W. Australia through northern Australia to E. Australian waters as far south as the temperate zone. The only record known to the author outside of the stated range of the species is that of Whitelegge (1903, p. 11) from Nauru or Pleasant Is., Gilbert Group, in the western Pacific.

REMARKS: The specimens exhibited the characteristic longitudinal bands of red and porcelain-white on carapace and limbs, and the species was not uncommon at the locality.

Examples are in the Australian Museum collection from as far south on the N.S. Wales coast as Port Hacking and Broken Bay. The occurrence in this temperate zone, however, is not common.

Genus *DARDANUS* Paulson, 1875

Dardanus megistos (Herbst)

Pagurus punctulatus: Alcock, 1905, pp. 80, 81, pl. vii, fig. 1 (syn. & full refs.).
Dardanus megistos: Hale, 1927, p. 92, fig. 88 (after Alcock). Stephenson, Stephenson, Tandy and Spender, 1931, p. 44; Joan Gordan, 1956, p. 315 (syn. & full refs.); Gillett and McNeill, 1962, p. 116, pl. 115, p. 118, pl. 116 (colour).
Pagurus megistos: Barnard, 1950, pp. 422, 425; text fig. 79c (syn. & full refs.); Fize and Serène, 1955, pp. 159, 160, pl. iv, figs. 1-3, text figs. 24A-C (syn., full refs., descr.).

LOCALITIES: General Survey – Low Isles; the North-east Moat; 10.iv.1929 (1 large male, with major hand 55 mm long): Low Isles; reef flat at low tide (4 males and 4 females; major hand of largest specimen – a female – measuring 28 mm): Three Isles; reef flat at low tide; May, 1929 (1 male, with major hand 37·5 mm long).

DISTRIBUTION: Ranges widely in tropical to temperate Indo-Pacific region – E. Africa, Madagascar Mauritius, Red Sea to Indian seas, China Sea, southern Japan, Malay Archipel., Australian coast (including S. Australia), Hawaii and Tahiti.

REMARKS: This strikingly handsome, hirsute, orange-red species is the largest of the hermit crabs of the Great Barrier Reef. Both carapace and limbs are decorated with numerous dark-bordered, porcelain-white spots. Examples were common at Low Isles, particularly on the Thalamita Flat, where they occurred at low tide either under or near flat, eroded conglomerate slabs.

Dardanus deformis (H. M. Edwards)

Pagurus deformis: Alcock, 1905, pp. 81, 88, p. ix, fig. 4 (syn. & full refs.); Boone, 1935, p. 28, pl. 5 (syn. & refs.); Barnard, 1950, pp. 423, 428 (refs.); Fize and Serène, 1955, pp. 159, 199, pl. IV, fig. 6, text figs. 31A-C, 33E-F (syn., full refs., descr.).
Dardanus deformis: Joan Gordan, 1956, p. 313 (syn. & full refs.); Gillett and McNeill, 1962, p. 118, pl. 117 (colour).

LOCALITIES: General Survey – Low Isles; reef flat at low tide; in area marked F7 on published key chart; 10.iv.1929 (1 female): from Sediment Pot on reef flat at low tide; 31.iii.1929 (8 females): Low Isles and nearby Batt Reef; reef flats at low tide (15 specimens): Three Isles; reef flat at low tide (1 specimen).

DISTRIBUTION: Widely dispersed in tropical to temperate Indo-Pacific region – E. Africa, Madagascar, Mauritius, Indian seas to southern Japan, Malay Archipel., Australia, and eastwards to Hawaii, Tahiti and Tuamotu.

REMARKS: All the specimens have the outside of the propodus and the dactylus of the second ambulatory limb of the left side characteristically enlarged and grooved. The species was fairly common at Low Isles, except on the Sand Flat. Its dwellings were usually the shells of *Turbo*, to which one or more commensal anemones (*Calliactis miriam*) were always attached.

Dardanus sanguinolentus Quoy and Gaimard

Pagurus euopsis: Alcock, 1905, pp. 80, 86, pl. ix, fig. 2 (syn. & earlier refs.); Barnard, 1950, pp. 423, 427 (syn. & full refs.).
Pagurus sanguinolentus: Forest, 1953, p. 559, text figs. 12-14 (syn. & refs.); Fize and Serène, 1955, pp. 159, 166, pl. IV, figs. 4-5, text figs. 25A-C (syn., full refs., descr.).
Dardanus euopsis: Joan Gordan, 1956, p. 314 (syn. & refs.).

LOCALITIES: Low Isles; S.W. quarter of reef system; no specific habitat noted (1 male): Batt Reef, near Low Isles; low tide (1 female).

DISTRIBUTION: Ranges widely in tropical Indo-Pacific region – E. Africa, Mauritius, Red Sea, Indian seas to southern Japan, Malay Archipel., N.E. Australia, and eastwards to Samoa and Tahiti.

COLOUR NOTE: An unmistakable red and cream coloured species in life, with long mottled hairs on the limbs.

Dardanus scutellatus H. M. Edwards

Pagurus fabimanus: Whitelegge, 1897, p. 142 (ref.; record only); Alcock, 1905, pp. 80, 84, pl. viii, fig. 2 (refs.); Barnard, 1950, p. 427 (refs.); Stephenson, Endean and Bennett, 1958, pp. 269, 281.
Pagurus scutellatus: Forest, 1953, p. 560 (syn. & refs.); Fize and Serène, 1955, pp. 159, 189, pl. VI, figs. 5-10, text figs. 29A, B, B1, C (syn., full refs., descr.).
Dardanus fabimanus: Joan Gordan, 1956, p. 314 (syn. & refs.); Gillett and McNeill, 1962, p. 118, pl. 117 (colour).

LOCALITY: Batt Reef, near Low Isles; low tide (1 female, ovig.).

DISTRIBUTION: E. Africa, Mauritius, Indian seas, Viet-Nam, Malay Archipel., Marshall, Ellis and Solomon Islands, N.E. Australia, Tonga, Fiji and Tahiti.

REMARKS: In Alcock's figure of the species the last two joints of the third left leg are not clearly shown as being flattened. This character, however, is definitely recorded in his description.

The first record of this species from Australian waters is that by Stephenson and others (1958), based on a specimen or specimens from Low Isles. This listing, although not then claimed, constituted an addition to the Australian marine fauna. The example illustrated by Gillett and McNeill (1962) was photographed at Heron Is., Capricorn Group, Queensland.

Examples are in the Australian Museum collection from the Solomons (1 specimen), Heron Is., Capricorn Group, Queensland (4 specimens), and Funafuti, Ellice Islands (1 specimen). The last named was the one recorded by Whitelegge (1897) and, although small, is a faithful identification of the species.

Dardanus imbricatus (H. M. Edwards)

Pagurus imbricatus: Alcock, 1905, pp. 81, 92, pl. ix, fig. 8 (refs.); Miers, 1884, p. 264 (ref.); Balss, 1921, p. 21 (ref.); Fize and Serène, 1955, pp. 159, 220, pl. VI, figs. 11-14, text figs. 35A-C (full refs., descr.).
Dardanus imbricatus: Joan Gordan, 1956, p. 314 (syn. & refs.).
[Not *Dardanus imbricatus* Rathbun, 1910, p. 556, pl. 49, fig. 3; locality – Peru = *Pagurus peruensis* Balss, 1921, p. 21.]

LOCALITIES: Stn. XIV, dredge; ½ mile S.E. of Lizard Is., off Lookout Point; 19 fms; 7.iii.1929 (1 specimen): Stn. XXIII, dredge; in lee of Turtle Isles, off Lookout Point; 8 fms; 12.iii.1929 (1 specimen).

DISTRIBUTION: Ceylon, Viet-Nam, W. Australia, Torres Strait, N.E. Australia.

Genus *PAGURUS* Fabricius, 1775
Pagurus janitor (Alcock)

Eupagurus janitor Alcock, 1905, pp. 125, 132, pl. xi, fig. 6: 1905a, p. 832, pl. lxviii, figs. 2 & 4; Stephenson, Endean and Bennett, 1958, p. 269.
Pagurus janitor: Joan Gordan, 1956, p. 331 (syn. & refs.).

LOCALITY: Low Isles; no specific habitat; an additional record from the locality subsequent to the British Great Barrier Reef Expd. of 1928-29.

DISTRIBUTION: Tropical Indo-west-Pacific – Maldives, N.E. Australia.

The record from Low Isles apparently greatly extends the known range of this species; any other published records of its occurrence in localities additional to those listed here are unknown to the author.

The species was previously listed only as a name among other Decapoda collected at Low Isles (W. Stephenson and others, 1958). No mention was then made of the fact that it had not previously been recorded from Australian waters.

Family **COENOBITIDAE**
Genus *COENOBITA* Latreille, 1826
Coenobita rugosa H. M. Edwards

Coenobita rugosus: Alcock, 1905, pp. 141, 143, pl. xiv, figs. 3, 3a (syn. & full refs.); McCulloch, 1909, p. 306 (ref.); Barnard, 1950, p. 469, text fig. 86 (syn. & refs.).
Coenobita rugosa: Fize and Serène, 1955, pp. 5, 12, pl. I, figs. 3, 5, 7, 8-10, text figs. 2A-C, 3A (syn., full refs., descr.).

LOCALITY: Low Isles; sand cay (1 specimen).

DISTRIBUTION: Ranges widely from Red Sea and E. Africa to the eastern region of the Pacific, mainly tropical. Heller's "Sydney", N.S. Wales record of the species is incorrect (see McCulloch, 1909).

REMARKS: The stridulating tubercles on the upper part of the outer surface of the left cheliped are not well developed; this condition is due to the juvenile state of the specimen.

During a prolonged period of drought towards the end of 1928 a number of examples were enticed at night from their hiding places by placing a sack soaked with fresh water in open spaces on the surface of the sand.

Section GALATHEIDEA
Family **GALATHEIDAE**
Genus *GALATHEA* Fabricius, 1798
Galathea whiteleggii Grant and McCulloch

Galathea sp. Whitelegge, 1900, p. 191.
Galathea whiteleggii Grant and McCulloch, 1906, p. 45, pl. iv, figs. 2, 2a (ref.).

LOCALITIES: Stn. XII, dredge; Penguin Channel, between Snapper Is. and Cape Kimberley; 10–15½ fms; 24.ii.1929 (1 specimen): off Low Isles; dredged in 12 fms; 16.x.1928 (1 specimen).

DISTRIBUTION: Range appears to be restricted to E. coast of Australia, from temperate to tropical parts.

REMARKS: Although the anterior part of the carapace of the Low Isles specimen is somewhat damaged, it is undoubtedly referable to the above species. This has been established by a careful comparison with the holotype in the Australian Museum. The second specimen from Stn. XII is referred here with but slight reservation. It agrees with the holotype except for the absence of three

definite teeth on the inner border of the merus of the third maxillipeds. The case suggests that this character has not the importance attaching to it that Grant and McCulloch (1906) supposed.

The present record constitutes an addition to the fauna of tropical Queensland, which is believed to be more the natural centre of distribution of the species than the temperate waters of the N.S. Wales coast to the southward, where the holotype originated.

Galathea australiensis Stimpson

Galathea corallicola Haswell, 1882a, p. 761.
Galathea australiensis: Grant and McCulloch, 1906, pp. 43, 44, pl. iv, figs. 1, 1a (syn. & full refs.); Stimpson, 1907, p. 230 (ref.).

Localities: Low Isles; Madrepore Moat; common among branches of dead growths (17 specimens, including both sexes): Batt Reef, near Low Isles; low tide (1 specimen).

Distribution: Temperate and tropical Australian coastal waters, and apparently extending northwards to the waters of southern Japan.

Remarks: Four male examples of the series possess enlarged teeth or tubercles on the proximal half of the cutting edges of the fingers of the major chelipeds. A further senile male has the right cheliped with the fingers curved and gaping as described by Grant and McCulloch (1906).

Galathea aculeata Haswell

Galathea aculeata Haswell, 1882a, p. 761: Whitelegge, 1900, p. 190 (refs.); Grant and McCulloch, 1906, pp. 43, 48, pl. iv, figs. 4, 4a (refs.).

Localities: Stn. XIV, dredge; ½ mile S.E. of Lizard Is., off Lookout Point; 19 fms; 7.iii.1929 (3 specimens): Stn. XVI, dredge; about ½ mile W. of N. Direction Is., off Lookout Point; 20 fms; 9.iii.1929 (2 specimens): Stn. XVII, dredge; about ½ mile N. of N. Direction Is.; 19 fms; 9.iii.1929 (3 specimens): dredged off Low Isles; 9–12 fms; 18.x.1928 (1 specimen).

Distribution: The known positive occurrences are in the waters of the N.E. Australian coast. Whitelegge (1900) questions the validity of records from off Tonga and the Philippines by Henderson (1888, p. 120) and equal doubt also probably applies to Miers's record of a specimen in the British Museum from the Philippines (1884, p. 278).

All the specimens have been critically compared with Haswell's holotype of the species, from Holborn Is., Queensland, in the collection of the Australian Museum.

Galathea elegans Adams and White

Galathea elegans Adams and White, 1848, p. ii, pl. xii, fig. 7: Grant and McCulloch, 1906, pp. 43, 50, pl. iv, figs. 6-6a (syn. & refs.); Miyake, 1938, p. 37, pl. 2, figs. 1a-c (refs.); Barnard, 1950, p. 487, text figs. 91i-k, on p. 484 (syn. & refs.).

Locality: Stn. XIV, dredge; ½ mile S.E. of Lizard Is., off Lookout Point; 19 fms; 7.iii.1929 (1 specimen).

Distribution: Ranges widely in warmer Indo-Pacific region – E. Africa to Indian seas and southern Japan, the Malay Archipel., N.W. and N.E. Australia.

Family **PORCELLANIDAE**

Genus ***PACHYCHELES*** Stimpson, 1858

Pachycheles pulchellus Haswell

Pachycheles pulchellus Haswell, 1882a, p. 758: Miers, 1884, p. 273, pl. xxx, fig. A.

LOCALITIES: Stn. IX, dredge; Penguin Channel, between Snapper Is. and Cape Kimberley; 12–4 fms; 22.ii.1929 (2 specimens): off Low Isles, dredge; 9–10 fms; 18.x.1928 (2 specimens).

DISTRIBUTION: Known only from a restricted range – Arafura Sea and N. Australia, to S. of New Guinea, Torres Strait and N.E. Australia.

Genus ***PISIDIA*** Leach, 1820

Pisidia dispar (Stimpson)

Porcellana dispar: Miers, 1884, p. 275, pl. xxx, fig. c; Stimpson, 1907, p. 190, pl. xxiii, fig. 3 (ref.).
Pisidia dispar Haig, 1965, p. 107.

LOCALITY: Low Isles; reef flat generally – no specific habitat (3 specimens): Batt Reef, near Low Isles; low tide; Oct. 1929 (1 male, 2 females).

DISTRIBUTION: Apparently restricted in range from N.W. Australia to N.E. and E. Australian coasts and South Australia.

In the temperate waters of the southern limits of its range this species is very abundant. It is there that examples grow to their largest size, as demonstrated by the great amount of Australian material of the species in the Australian Museum collection.

Genus ***PORCELLANA*** Lamarck, 1801

Porcellana serratifrons Stimpson

Porcellana serratifrons: Grant and McCulloch, 1906, p. 39 (syn. & refs.); Stimpson, 1907, p. 189, pl. xxiii, fig. 2 (ref.).

LOCALITY: Off Low Isles; dredged 9–10 fms; 18.x.1928 (1 specimen).

DISTRIBUTION: Hongkong, Arafura Sea and N.E. Australia.

REMARKS: Grant and McCulloch's 1906 record is regarded as *Pisidia* cf. *spinulifrons* (Miers) by Janet Haig in her 1965 paper (p. 106), which appeared too late to be referred to in detail here. Haig states that this form is to be redescribed as new by D. S. Johnson in a forthcoming paper. In view of the confusion over the status of the names involved here, the author tentatively retains Stimpson's species.

Porcellana streptochira de Man

Porcellana (*Porcellana*) *streptochira* de Man, 1887a, p. 419, pl. 18, fig. 6.
[Not *Porcellana streptochira* White, 1847, p. 64; *nomen nudum.*]

LOCALITY: Off Low Isles, dredge; 12 fms; 16.x.1928 (1 male).

DISTRIBUTION: Indonesian Archipel. (de Man); N.E. Australia (present record).

REMARKS: Miss Janet Haig of the Allan Hancock Foundation kindly examined and identified the single male example recorded here. In doing so she based her decision on the description and figure published by de Man, who believed he was dealing with the same species to which White had given the name *P. streptochira.* A significant fact is that de Man did not state on what grounds he had referred his material to White's *nomen nudum* species. This, according to Miss Haig, was of especial

importance, considering that Miers's earlier remarks (1884, p. 277) on White's British Museum specimen could quite readily apply to several closely related species. She considered that the question was a very vexed one, and the only solution was a comparison of White's specimen with de Man's excellent description and figure. Subsequent to the author's correspondence on the subject with Miss Haig, it was learned that D. S. Johnson, University of Singapore, had visited the British Museum and made a close study of the problem. In answer to a letter he has informed the author that "Miers made rather a strange mess of *P. streptochira*", which is undoubtedly identical with a species of his own. De Man, Johnson stated, "further confused matters by applying the name to a very different species". All of this means that the inadequately described *P. streptochira* from the Philippines is to be suppressed, and a new name is to be provided for the form described by de Man.

At the time of writing, the results of Johnson's study – the Galatheidea of Singapore – are in MS. form awaiting publication in a Bulletin of the National Museum of Singapore.

PETROLISTHES Stimpson, 1858

Petrolisthes haswelli Miers

Petrolisthes haswelli Miers, 1884, p. 269, pl. xxix, figs. A, a: Haig, 1965, p. 100.
[Not *P. haswelli* Whitelegge, 1897, p. 144.]

LOCALITY: Low Isles; reef flat at low tide; no specific habitat (1 male).

DISTRIBUTION: Previously recorded from Western Australia (see Haig, 1965, for details); Thursday Is., Torres Strait; Facing Is., Port Curtis, Queensland; and "Koo-Keang-San" or Koo-kien-san Is., Meiaco-Sima or Meia-co-shimah Group, near Formosa (Miers).

REMARKS: A little known species which, prior to the present record, has apparently not been recognized since originally described. The single example has been critically compared with Miers's figure and agrees with it in all particulars.

Following identification, the author submitted the single specimen to Janet Haig, Allan Hancock Foundation, for favour of her opinion. While she agreed that the characters fitted more than favourably with Miers's description and figure, she was inclined to the belief that the species should be referred to the synonymy of *P. lamarckii*. At a later date, however, Miss Haig wrote that she had since "seen several large specimens apparently belonging to *P. haswelli*", and was "by no means so sure as [she] was that it is a synonym of *P. lamarckii*". She further stated that, "in some ways, it seems closer to *P. boscii*", and considered that, "for the time being", she now felt "inclined to leave it as a distinct species".

Two specimens of the total of four recorded as *P. haswelli* from Funafuti, Ellice Islands, W. Pacific Ocean by Whitelegge (1897) have been found preserved in the Australian Museum collection, and bear a label in that late author's handwriting. They were afterwards re-identified by the late A. R. McCulloch as *P. lamarckii*, a species of which they are typical examples.

Petrolisthes lamarckii (Leach)

Petrolisthes lamarcki: Borradaile, 1898a, p. 464, pl. xxxvi, figs. 1a-b, 2 (syn. in part – *fide* Haig, 1964 – and refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 59, 61, 73; Barnard, 1950, p. 477, text figs. 89a-d (syn. & refs.); Gillett and McNeill, 1962, p. 120, pl. 120, fig. 1 (photo from life); Haig, 1964, p. 362 (syn. & full refs.).

LOCALITIES: Low Isles – The species was among the few most abundant and widespread of the decapod fauna. It was characteristic of both the outer and inner Shingle Ramparts, and the Boulder Tract. In fact, everywhere where bare and exposed accumulations of conglomerate rock occurred, the crabs could be found at low tide scuttling swiftly away immediately one delved below the surface. In

the areas noted, the total of specimens collected was well over one hundred. Only a small selection from the abundant and detailed General Survey material is listed here.

The Shingle Rampart; area RC on published key chart; 10.iii.1929 (2 specimens): The Shingle Rampart; areas RD and R16 on published key chart; 22.iii.1929 (7 specimens): the Boulder Tract; area B3 on published key chart (2 specimens): Snapper Is., near Low Isles; reef at low tide (10 specimens): Three Isles, near Cape Bedford; reef at low tide; 5.v.1929 (7 specimens).

DISTRIBUTION: Ranges widely in warmer seas of Indo-Pacific region, from E. Africa to Indian seas, Australia, north to Hongkong and Bonin Islands, through Malay Archipel., and eastwards to Polynesia as far as the Tuamotu or Low Archipelago.

REMARKS: Adults in large series of this species, irrespective of sex, are found to carry quite a noticeable amount of tomentum on both carapace and limbs.

Petrolisthes scabriculus (Dana)

Porcellana scabricula Dana, 1852, p. 424; 1855, pl. 26, fig. 13.
Petrolisthes scabriculus: de Man, 1902, p. 697 (syn. & refs.); Haig, 1964, p. 358, text fig. 2 (syn. & refs.); 1965, p. 98.

LOCALITY: Stn. XVII, dredge; about $\frac{1}{4}$ mile N. of N. Direction Is. off Lookout Point; 19 fms; 9.iii.1929 (1 juv. female).

DISTRIBUTION: Ranges in tropics from Philippines to eastern Malay Archipel., N.W. and N.E. Australia.

REMARKS: The species is very closely related to *Petrolisthes militaris* (Heller, 1868), of which *P. annulipes* (White) Miers, 1884 is a synonym. Janet Haig has informed the author that she has examined good series of both species, and is convinced that they can be readily separated, particularly by the character of the front (see Laurie, 1926, p. 142).

Petrolisthes militaris (Heller)

Porcellana militaris Heller, 1868, p. 75.
Petrolisthes annulipes (White) Miers, 1884, pp. 270, 558, pl. xxix, fig. B (ref.).
Porcellana (*Petrolisthes*) *militaris:* de Man, 1887a, p. 410 (ref.).
Petrolisthes militaris: Haig, 1964, p. 357, text fig. 1 (syn. & refs.); 1965, p. 98.

LOCALITY: Low Isles; Madrepore Moat; from interstices in basal part of dead growth (3 ovig. females).

DISTRIBUTION: Ranges widely in tropical Indo-west-Pacific – Seychelles, Indian seas, Philippines to southern Japan, Malay Archipel., N.W., N. and N.E. Australia.

Petrolisthes unilobatus Henderson

Petrolisthes unilobatus Henderson, 1888, p. 106, pl. xi, figs. 3, 3a: Miyake, 1943, pp. 55, 66, text figs. 7-8 (ref.); 1956, p. 309 (refs.).
Petrolisthes wolfi Sendler, 1923, p. 41, pl. 6, fig. 9.

LOCALITIES: General Survey – Low Isles; Asterina Spit and Boulder zone (common); 9.xi.1928 (4 specimens): Low Isles; various locations along the outer Ramparts; undersides of boulders (10 specimens).

DISTRIBUTION: Reported from Taiwan (Formosa), Ryukyu and Tongan Islands, New Hebrides, and now from N.E. Queensland.

Remarks: Miss Janet Haig, Allan Hancock Foundation, California, kindly assisted with this identification, and informed the author that, although she has not seen the type of Sendler's *P. wolfi*, she is confident of its identity with *P. unilobatus*. Henderson's illustration of the latter is not a good one, but the specimens from Low Isles agree very well with the description he gives. By comparison, both the description and the figures given by Miyake are very good.

The references to the species listed here appear to be the only ones available in literature.

P. unilobatus differs from allied species (*P. inermis*, *P. japonicus*, and *P. elongatus*) in having the carpus of the chelipeds unarmed on the posterior margin, except for the spine at the postero-distal angle.

The present record constitutes an addition to the Australian marine fauna.

Genus ***POLYONYX*** Stimpson, 1858

Polyonyx obesulus (White) Miers

Polyonyx obesulus Miers, 1884, p. 272, pl. xxix, figs. D, d' (ref.); Gordon, 1935, p. 11, text figs. 5a-c (refs.); Johnson, 1958, pp. 99, 108, text fig. 4 (syn. & full refs.); Haig, 1964, p. 378 (syn., refs. & discussion); 1965, p. 113.
Porcellana (*Polyonyx*) *obesula:* de Man, 1887a, p. 423 (syn. & refs.).
[Not *Polyonyx obesulus*? Grant and McCulloch, 1906, p. 41.*]

Localities: Stn. X, dredge; across Satellite Reef, near Low Isles, working on sides to S.W. and N.E.; 14–17 fms; 22.ii.1929 (1 specimen): Stn. XIX, dredge; about ½ mile N. of Eagle Is., off Lookout Point; 10 fms; 10.iii.1929 (1 specimen): Stn. XXIV, dredge; ¾ mile N.E. of Pasco Reef, near Two Isles, east of Lookout Point; 16½ fms; 13.iii.1929 (1 specimen): Low Isles; Madrepore Moat, from interstices of dead growth; Oct. 1928 (1 specimen): off Low Isles, dredge; 9–12 fms; 17.x.1928 (1 specimen, lacking major cheliped).

Distribution: Ranges widely in tropical Indo-Pacific region – Persian Gulf to Indian seas, South China Sea, Malay Archipel., N.W., N. and N.E. Australia.

In the determination of the present material the author has followed Johnson's (1958) very thorough study of the species. In a letter received from Janet Haig she states that the form of the dactylus of the walking leg is a good constant character by which *P. obesulus* can be separated from its close ally, *P. biunguiculatus* (Dana, 1852) – see Johnson (1958). She also stated that the difference in the form of the front is perhaps not so clearly marked as Gordon (1935) and Johnson believed. However, one good character Janet Haig claimed she has found was not mentioned by Johnson. This is that the males of *P. biunguiculatus* are without pleopods, just as in many species of *Pachycheles*.

Polyonyx suluensis (Dana)

Porcellana suluensis Dana, 1852, p. 414; 1855, pl. xxvi, fig. 4.
Polyonyx denticulatus Paulson, 1875, p. 89, pl. 11, fig. 6.†
Polyonyx hexagonalis Zehntner, 1894, p. 187, pl. 8, figs. 18, 18a.
Polyonyx suluensis: Haig, 1964, p. 373, text fig. 3 (syn., full refs. and discussion); 1965, p. 112.

Locality: Stn. XVI, dredge; about ½ mile W. of N. Direction Is., off Lookout Point; 9.iii.1929 (1 male, 1 ovig. female).

Distribution: Ranges widely in Indo-west Pacific region – Seychelles and Red Sea to southern Japan, and southwards to Malay Archipel., N.W. and N.E. Australia.

The present record considerably extends the known range of the species in Australian seas.

*Miss Janet Haig has informed the author that, upon examining the specimen on which this record was based, she found it to belong to the so-called "*spinensis*" group of Johnson (1958), and described it as *P. maccullochi* in 1965.

†An English translation from the original Russian was published in 1961 for the National Science Foundation, Washington, D.C. and Smithsonian Institution, U.S.A. by the Israel Program for Scientific Translations. Available from The Office of Technical Services, U.S. Dept. of Commerce, Washington, 25, D.C.

Polyonyx haigae sp.n.
(Text fig. 2; Plate I, fig. 1)

LOCALITY: Stn. V, Agassiz Trawl; Linden Bank, N. side entrance to Trinity Passage, E. of Cairns; 37 fms; mud; 24.xi.1928 (1 male, the holotype – carapace 6·1 mm wide; 5·3 mm long). Reg. No. B.M.(N.H.) 1967.8.9:1.

DESCRIPTION: Carapace only slightly broader than long; broadest at epibranchial level, the lateral margins converging only slightly behind this point, so that the carapace has a somewhat rectangular appearance posterior to the hepatic regions. Front broad, with median lobe sub-rectangular; frontal area scarcely deflexed. Carapace with sparse long, fine hairs, especially on frontal margin. Branched fine, long hairs on lateral margins of carapace.

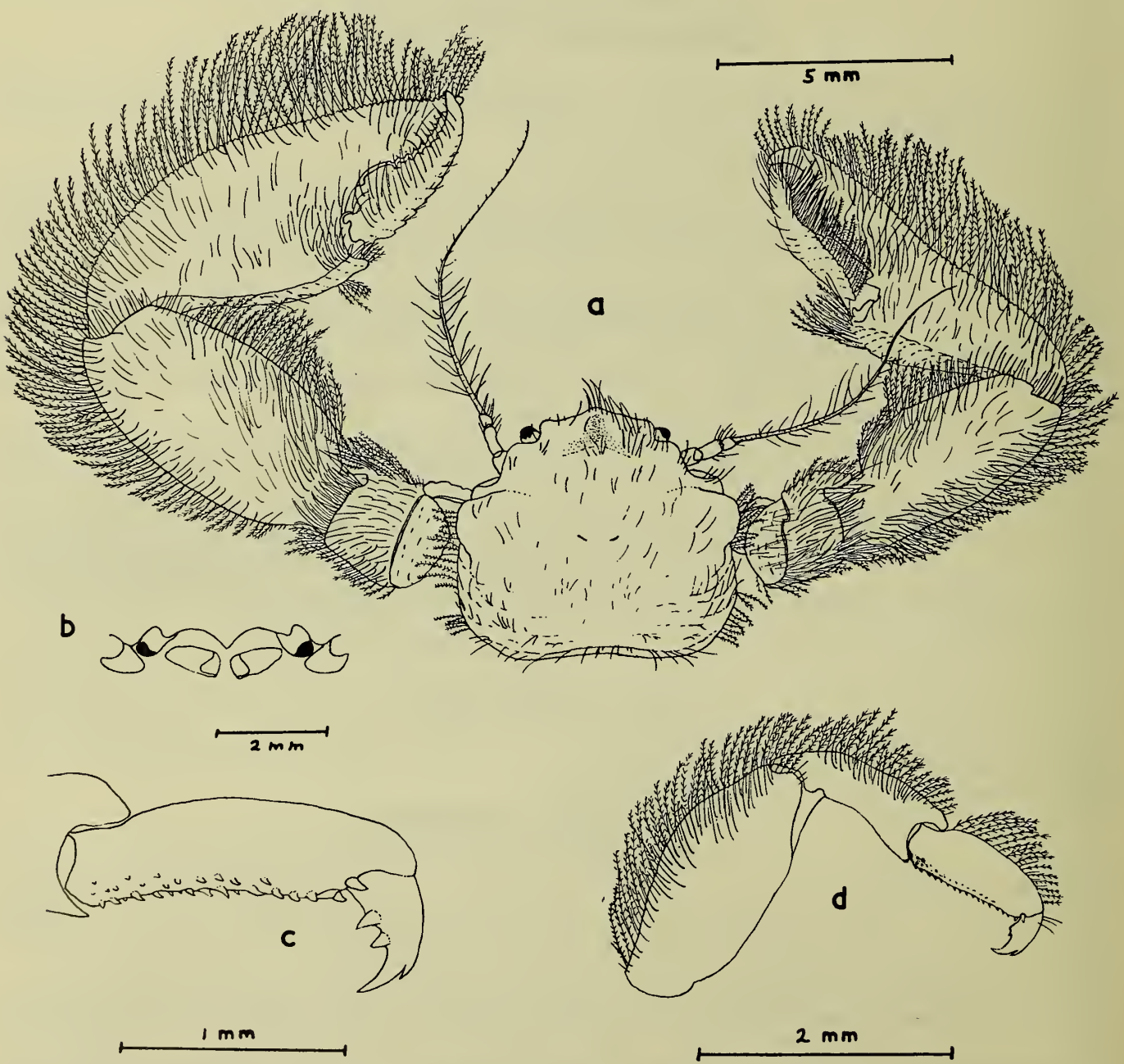

FIG. 2. *Polyonyx haigae* sp. n., holotype. a, carapace and chelipeds; b, anterior aspect, frontal region; c, right 2nd walking leg, propodus and dactylus; d, right 3rd walking leg. (*Del.* Janet Haig.)

Merus of chelipeds without a lobe on anterior margin. Carpus with anterior margin very slightly and evenly convex; about twice as long as wide in major cheliped. Major chela swollen, its outer margin nearly straight; minor chela narrow, with immovable finger markedly out-turned so that the outer margin is rather strongly concave. Fine, long hairs on the dorsal surface and inner and outer margins of chelipeds, and in the gape of the fingers; the hairs along the margins of these limbs are markedly plumose.

Margins of walking legs thickly covered with long, plumose hairs. Merus unarmed on lower margin; that of the third leg more than twice as long as wide. Lower margin of propodus covered with about four irregular longitudinal rows of very minute spinules, about 16 spinules in each row; propodus of third leg more than twice as long as wide. Dactylus with bifid tip, its lower margin with two movable spinules.

REMARKS: Miss Janet Haig, who has made a special study of the Porcellanidae, has informed the author that she is unaware of any other species of *Polyonyx* with a similar arrangement of spinules on the lower margin of the propodus of the walking legs. Two species – *P. transversus* (Haswell) and *P. pedalis* Nobili – agree with the new species in having a row of propodal spinules, and in lacking a lobe on the merus of the chelipeds. In both of these species, however, the carapace and front are differently shaped than in the new species, and the spinules on the lower margin of the propodus are larger and fewer in number.

The holotype falls naturally into the assemblage of species defined by Johnson (1958, p. 97) as the "*P. sinensis* Group". Miss Haig has, however, informed the author that there is much more variation in the form of the front than is indicated in Johnson's diagnosis. This, she stated, is exemplified in some of the species of *Polyonyx* from outside the Indo-Pacific area which were not considered by Johnson. It is also true of *P. haigae* described above.

The new species is named for Miss Janet Haig, Allan Hancock Foundation, University of Southern California, in appreciation of much generous help to the author, and for her recognition of the novelty of the species.

Section HIPPIDEA
Family **HIPPIDAE**
Genus ***HIPPA*** Fabricius, 1787
Hippa adactyla Fabricius

Remipes testudinarius: Miers, 1878, pp. 314, 316, pl. v, fig. 1 (syn. & full earlier refs.); Henderson, 1888, p. 38 (syn. & full refs.).

Hippa adactyla: Rathbun (in Stimpson), 1907, p. 195, pl. xix, fig. 1 (syn. & refs.); Barnard, 1950, p. 404, text figs. 76c-d (syn. & refs.).

LOCALITY: Off Low Isles; dredged presumably from a shallow depth (2 specimens).

DISTRIBUTION: Ranges widely in tropical to temperate Indo-Pacific regions, from E. African coast and Red Sea, and eastwards to the Californian coast, including Australia.

REMARKS: The species occurs very commonly in the loose sand of beaches along the water's edge. A note on this habit was made in 1907 at Murray Is., Torres Strait by the late A. R. McCulloch, Australian Museum. It states that the natives there called the crab "Nam" (=turtle), and secured examples for fish bait by walking along the waterline and scooping them out of the sand with their feet. These movements were necessarily dextrous, for the crabs would instantly burrow again, and their light colouring made them doubly difficult to detect. When placed upon a hard surface they would move backwards with a rapid, shuffling motion.

Section DROMIACEA
Family **DROMIIDAE**
Genus ***CRYPTODROMIA*** Stimpson, 1858
Cryptodromia tuberculata Stimpson

Cryptodromia tuberculata: Stimpson, 1907, p. 174, pl. xxi, fig. 6 (ref.): Sakai, 1936, pp. 15, 16, 17, 60, pl. vi, fig. 3 (refs.); Buitendijk, 1939, p. 225 (ref.).

LOCALITIES: General Survey – Low Isles; Shingle Rampart; area RC on published key chart; 20.iii.1929 (2 males): Boulder Tract; area B3 on published key chart (1 female): Low Isles; reef flat generally, mostly from underside of eroded conglomerate boulders (2 males, 9 females): Three Isles, north of Cape Bedford; May, 1929 (2 males, 1 ovig. female; the latter collected at the anchorage; 4.v.1929).

All of the specimens were small or juvenile, the largest being a female measuring 9·5 mm across the carapace.

DISTRIBUTION: India to southern Japan, Malay Archipel., N.W. and N.E. Australia.

Among Malay Archipelago localities listed by Buitendijk are records of the occurrence from as near to N.E. Australia as Amboina and Timor.

The species has only once before been recognized from Australian coastal waters (see Balss, 1935, p. 115).

Genus ***PETALOMERA*** Stimpson, 1858
Petalomera lateralis (Gray)

Cryptodromia lateralis: Stimpson, 1907, p. 174, pl. xx, fig. 3 (syn. & ref.).
Petalomera lateralis: Montgomery, 1922, p. 193, text figs. 1-3 (syn. & ref.); Rathbun, 1923, p. 153 (syn. & refs.); Hale, 1925, pp. 405, 410, pl. xl, B (refs.); Stephenson, Endean and Bennett, 1958, pp. 269, 274.

LOCALITY: Low Isles; "Under-rock Fauna, Beach Rock"; an additional record from the locality subsequent to the British Great Barrier Reef Expd. of 1928-29.

DISTRIBUTION: Zoogeographical range appears to extend northwards from temperate southern Australian waters to warmer tropical parts. Recorded from Kangaroo Is., South Australia; Port Phillip, Victoria; Bass Strait; New South Wales; coast of Queensland; Philippines. A record of the occurrence of the species in Japanese waters (Miers, 1884) is considered by Sakai (1936, p. 23) as unreliable. Previous records of *P. lateralis* from New Zealand waters presumably all refer to *Petalomera wilsoni* (Fulton and Grant), the only dromiid now recognized from that area (see discussion in Bennett, 1964, p. 27).

Section OXYSTOMATA
Family **LEUCOSIIDAE**
Genus ***IXA*** Leach, 1815
Ixa inermis Leach

Ixa inermis: Ihle, 1918, pp. 267, 304, 314 (refs.); McNeill, 1942, p. 430, illustr.; Holthuis and Gottlieb, 1956, pp. 294, 296, pl. v, fig. 1; text fig. 2 (ref.).

LOCALITY: Off Low Isles, Agassiz Trawl; about 9 fms; 17.x.1928 (1 male – 31·5 mm wide).

DISTRIBUTION: Malay Archipel., N.E. Australia.

Genus *LEUCOSIA* Weber, 1795
Leucosia anatum (Herbst)

Leucosia longifrons de Haan (1833-50), 1841, p. 132, pl. xxxiii, fig. 6.
Leucosia polita Hess, 1865, p. 155, pl. vi, fig. 14.
Leucosia neocaledonica A. M. Edwards, 1874, p. 40, pl. 2, figs. 1-1e.
Leucosia pulcherrima Miers, 1877, p. 236, pl. xxxviii, figs. 4-6.
Leucosia ornata Miers, 1877, p. 236, pl. xxxviii, figs. 7-9.
Leucosia splendida Haswell, 1879a, p. 47, pl. v, fig. 1.
Leucosia australiensis Miers, 1886, p. 322, pl. xxvii, fig. 1.
Leucosia anatum: Tyndale-Biscoe and George, 1962, p. 80, pl. iii, figs. 1-2, text figs. 5-6 (full syn. & refs.).

LOCALITIES: N.W. of Low Isles; dredged in about 8 fms (1 female, ovig.): ¼ mile S. of Cape Kimberley, near Daintree River; dredged in 4 fms (1 female, ovig.).

DISTRIBUTION: Indo-west-Pacific region, mainly tropical; ranges from Persian Gulf to Indian seas and southern Japan, W. Australia, Torres Strait, E. Australia, New Caledonia and Fiji.

REMARKS: The examples of the species recorded here are referred to the form "Morph A" designated by Tyndale-Biscoe and George. These authors have made an exhaustive study of this species, previously loosely defined, and their lengthy discussion is both illuminating and convincing.

Leucosia margaritata A. M. Edwards

Leucosia margaritata A. M. Edwards, 1874, p. 42, pl. 2, figs. 3, 3a: Ihle, 1918, pp. 284, 305, 316 (refs.).

LOCALITY: Off Low Isles, dredge (1 female).

DISTRIBUTION: Tropical Indo-west-Pacific region; ranging from Persian Gulf to India, the Andamans, Malay Archipel., N.E. Australia and New Caledonia.

The species has, apparently, not previously been recorded from Australian coastal waters.

Leucosia whitei Bell

Leucosia whitei Bell, 1855, p. 289, pl. xxxi, fig. 2: Ihle, 1918, pp. 283, 305, 316 (refs.); Barnard, 1950, p. 386, text fig. 71h (refs.); Tyndale-Biscoe and George, 1962, p. 77, pl. I, figs. 6, 9, pl. II, figs. 6, 9 (refs. in part; not *L.* "*cheverti*" Haswell).

LOCALITY: W. of Low Isles; dredged in about 7 fms; 15.xi.1928 (1 male).

DISTRIBUTION: Indo-west-Pacific region; ranging from E. Africa to India, Andaman Islands, Malay Archipel., Arafura Sea, W. and N.E. Australia.

REMARKS: Bell referred to the presence of sparse hair on this species. The male example recorded here possesses this character. It has a spongy pubescence along the postero-lateral margins of the carapace, and a small patch is also present on the surface of each of the chelipeds where they pass under the edge of the carapace.

Leucosia chevertii Haswell (1879a, p. 47, pl. xxxi, fig. 2) has been wrongly associated in literature with *L. whitei*. It is here considered to be a valid species but has apparently not been collected since originally described. Ihle (1918), Alcock (1896, p. 225), and Miers (1884, p. 249) all indicated that *L. chevertii* might be a synonym of *L. whitei* and, more recently, Tyndale-Biscoe and George (1962) have decided that the two are actually synonymous.

Haswell recorded that his type material of *L. chevertii* was housed in the Macleay Museum, University of Sydney. A single dried female specimen (carapace 8 mm wide) was seen there and critically examined by the author in the late 1950s. It bore the locality "Darnley Island" which is in Torres Strait, and was the only specimen then extant from either of the two localities listed by Haswell.

As Tyndale-Biscoe and George were unsuccessful in a later search for type material in the Macleay Museum, they had to rely for justification of their claim on Haswell's published description and the rather poor figure appearing in the same work. Following on the publication of Tyndale-Biscoe and George's comments, an attempt was made to re-examine the Darnley Island specimen. However, a detailed search in the Macleay Museum (September, 1965) failed to locate any material identified as *L. chevertii*. Regrettably, it must now be assumed that the type specimens are lost.

There can be no doubt that the male example of *L. whitei* recorded here from near Low Isles is correctly identified. It thus provided the present author with the opportunity of critically comparing the two species from direct observations made in the 1950s. Following are some substantial differential characters either not shown in Haswell's published figure, or not given enough detailed attention in his description.

The single, prominent and smooth elevation (not tubercle) shown on each hepatic region in the figure of *L. chevertii* was clearly present on the specimen examined. These two elevations are rather elongated, low anteriorly, and reach their maximum height in a peak posteriorly. An important feature not shown in Haswell's figure is the pattern of the tubercular ridges on and near the lower margin of each hand. The marginal ridge forms a kind of flange running from the base of the hand to beyond the base of the immovable finger. Also originating at the lower basal angle of the hand is a much thicker, flange-like ridge which sweeps forwards in a low curve as it diminishes in size and almost joins up with the lower flanged ridge at its extremity. Above the upper flanged tubercular ridge again is a rather indistinct row of three tubercles. The line of pubescence along the postero-lateral margins of the carapace is very distinct and well developed. A small patch of conspicuous pubescence is also present on the upper surface of the merus of each cheliped where this joint passes under the edge of the carapace.

Genus ***MYRA*** Leach, 1817
Myra fugax (Fabricius)

Myra carinata Bell, 1855, p. 29, pl. xxxii, fig. 5.
Myra fugax: Alcock, 1896, pp. 201, 202 (syn. & earlier refs.); Ihle, 1918, pp. 256, 303, 313 (syn. & refs.); Sakai, 1937, pp. 134, 183, pl. xiv, fig. 5 (refs.).

LOCALITIES: Stn. IX, dredge; Penguin Channel, between Snapper Is. and Cape Kimberley; 12–14 fms; 22.ii.1929 (1 female): Stn. XII, dredge; Penguin Channel; 10–15½ fms; 24.ii.1929 (1 male).

DISTRIBUTION: Indo-west-Pacific region generally – Red Sea, S. and E. Africa, Madagascar, Indian seas to China coast, southern Japan, Malay Archipel., N.W. and N.E. Australia, and New Caledonia. The species also penetrates to the waters of the Eastern Mediterranean.

Genus ***MYRODES*** Bell, 1855
Myrodes eudactylus Bell

Myrodes eudactylus Bell, 1855, p. 299, pl. xxxii, fig. 6: Alcock, 1896, p. 255 (syn. & earlier refs.); Ihle, 1918, pp. 262, 303, 313 (syn. & refs.).
Myra eudactyla: Haswell, 1882, p. 123 (syn. & refs.).

LOCALITY: W. of Low Isles; dredged in about 7 fms; gravelly mud; 15.ix.1928 (1 male).

DISTRIBUTION: Tropical Indo-west-Pacific region – Andamans to Philippines, Siam, Arafura Sea, W. and N.E. Australia and New Caledonia.

Genus *PSEUDOPHILYRA* Miers, 1879
Pseudophilyra tenuipes Ihle

Pseudophilyra tenuipes Ihle, 1918, pp. 268, 271, text fig. 141.

LOCALITY: Off Low Isles; dredged in 9–12 fms; 17.x.1928 (1 male, 2 females; male the largest, with carapace 7 mm wide).

DISTRIBUTION: Tual, Kei Is., W. of New Guinea (type locality) and N.E. Queensland.

REMARKS: Ihle's single example was an ovigerous female with carapace 5·25 mm wide. The figure he gives shows the teeth on the cutting edges of the right cheliped to be only faintly developed. This condition would be due to the sex of the specimen; it is smaller than the male in the present material which shows marked development of the teeth on the cutting edges of its right cheliped.

The present record constitutes an addition to the Australian faunal list.

Family **CALAPPIDAE**
Genus *CALAPPA* Fabricius, 1798
Calappa hepatica (Linnaeus)

Calappa hepatica: Alcock, 1896, pp. 141, 142 (syn. & earlier refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 44, 52; Sakai, 1937, pp. 88, 89, 181, pl. xii, fig. 2 (syn. & refs.); Barnard, 1950, p. 348, text figs. 66a-d (syn. & refs.); Tyndale-Biscoe and George, 1962, p. 69 (Australian refs.).

LOCALITIES: General Survey – Low Isles; isolated moat pool; area M7 on published key chart; 20.iii.1929 (1 female): Anchorage Reefs; area A4 on published key chart; 10.iv.1929 (1 male): Low Isles; no specific habitat; 28.iii.1929 (1 male): reef flat generally; Aug. to Nov., 1928 (1 male, 4 females – male the largest, with carapace 70 mm wide).

DISTRIBUTION: Ranges widely in Indo-Pacific, especially on tropical coral reefs – E. Africa, Red Sea, Indian seas to China and southern Japan, Malay Archipel., Australia, and eastwards through Oceania to Hawaii, Tahiti, Tuamotus, and Clipperton Is. in far eastern Pacific.

A comparatively common species along the length of the Great Barrier Reef. At Low Isles it appeared to be more common on the Sand Flat than elsewhere.

Section BRACHYURA
Family **MAJIDAE**
Genus *TIARINIA* Dana, 1852
Tiarinia angusta Dana

Tiarinia angusta Dana, 1852, p. 113; 1855, pl. iii, figs. 7a-b: Sakai, 1938, pp. 318, 322, 359 (refs.); Buitendijk, 1939, p. 257, text fig. 24 (ref.).

LOCALITIES: Low Isles – reef flat at low tide; Sept. 1928 (1 male): Three Isles, N. of Cape Bedford; reef flat at low tide (1 male, 1 female).

DISTRIBUTION: S.W. Pacific region, from southern Japan to Philippines, through Malay Archipel. to Torres Strait and N.E. Australia.

Genus *TYLOCARCINUS* Miers, 1879
Tylocarcinus styx (Herbst)

Microphrys styx: A. M. Edwards, 1872, p. 247, pl. xi, fig. 4 (refs.).
Tylocarcinus styx: Alcock, 1895, p. 235 (syn. & earlier refs.); Sakai, 1938, pp. 271, 356, pl. xxxvi, fig. 5 (syn. & refs.).

LOCALITY: Ribbon Reef, near Lizard Is., off Lookout Point; seaward sloping zone, low tide; 4.vi.1929 (1 female).

DISTRIBUTION: Tropical Indo-Pacific region generally – Red Sea, E. Africa and Mauritius to southern Japan, Micronesia, Malay Archipel., Solomons. Torres Strait, N.E. Australia, New Caledonia, Fiji, New Hebrides, and Samoa.

REMARKS: This species is one well known to the author, and is represented in the Australian Museum collection by 46 specimens. While previous records include Torres Strait (Calman, 1900, p. 37) as the locality nearest to Australian coastal waters, it can now be recorded that specimens examined from eight localities extend the range as far south along the N.E. Australian coast as the Capricorn Group of coral cays at the southern end of the Great Barrier Reef. There are, in addition, other specimens of the same series from the Solomons, New Guinea, Loyalty Islands off New Caledonia, Willis Is. in the Coral Sea, and Fiji.

Genus *MENAETHIUS* H. M. Edwards, 1834
Menaethius monoceros (Latreille)

Menaethius monoceros: Alcock, 1895, p. 197 (syn. & earlier refs.); Barnard, 1950, p. 43, text figs. 9g-h (syn. & refs.).

LOCALITIES: General Survey – Low Isles; reef flat close to sand cay, low tide; in area marked F1 on published key chart (1 female): reef flat between Anchorage Reefs and the Mangrove Park; in area marked F7 and F8 on published key chart; 10.iv.1929 (1 female): Low Isles; reef flat at low tide; no specific area (1 male, 2 females): Batt Reef, near Low Isles, low tide; 13.ix.1928 (3 females): Three Isles, N. of Cape Bedford; reef at low tide; 5.v.1929 (1 male).

DISTRIBUTION: A widespread Indo-Pacific species, mainly tropical – E. Africa, Mauritius, Red Sea, Indian seas to southern Japan, Micronesia, Malay Archipel., Australia, and eastwards to Fiji, Samoa, Hawaii, Tahiti, and Tuamotu Islands.

The species was not uncommon at the locality and occurs abundantly on coral reefs along the N.E. Australian coast. The usual habitat is the sparse weed growths attached to conglomerate boulders and slabs on the reef flats.

Genus *CYCLAX* Dana, 1851
Cyclax spinicinctus Heller

Cyclax spinicinctus Heller, 1861, p. 4; 1861a, p. 304, pl. I, figs. 7-8; Forest and Guinot, 1961, pp. 15-24, pl. vi, fig. 3, text figs. 7, 8, 11 (syn., refs. & full discussion).
Cyclomaia margaritata A. M. Edwards, 1872, p. 236, pl. x, figs. 2-3.

LOCALITY: Three Isles, north of Cape Bedford; no specific habitat; May, 1929 (1 male; carapace 18 mm wide, excluding spines).

DISTRIBUTION: Ranges widely in tropical Indo-Pacific region – Established occurrences are E. Africa, Madagascar, Red Sea (doubtfully in Indian seas), Western Australia, Murray Is. in Torres Strait, N.E. Australia, New Caledonia, and Samoa.

REMARKS: The single male example in the collection made by the British Great Barrier Reef

Exped. 1928–29 was returned to the British Museum some years ago by the present author, being identified then as *Cyclax suborbicularis* (Stimpson). Forest and Guinot have since made a critical examination of this same specimen, have re-determined it as *C. spinicinctus*, and listed it as that species in their 1961 work. Much confusion obviously exists as to the exact occurrence of the two species over a very wide range in the tropical Indo-Pacific region. A lengthy presentation of the known facts on distribution has been published by Forest and Guinot. These authors are definite in claiming *C. spinicinctus* as the correct name for specimens examined by them from Murray Island in Torres Strait, Great Barrier Reef of Australia and New Caledonia, and this has caused the acceptance of their identification in the present instance.

Genus ***MICIPPA*** Leach, 1817
Micippa philyra (Herbst)

Micippa philyra: Alcock, 1895, p. 249 (*pro parte* syn. & earlier refs.); Sakai, 1938, pp. 312, 315, 358, pl. xxxviii, fig. 6, text fig. 45 (syn. & refs.); Buitendijk, 1939, pp. 253, 255, pl. x, figs. 1, 3, text fig. 21 (syn. & full refs.).*

Localities: General Survey – Low Isles; at low tide, between Anchorage Reefs and Tripneustes Spit; 11.iv.1929 (1 male): at low tide, in area RD and R16 on published key chart; 22.iii.1929 (1 female): Stn. XVI, dredge; about ½ mile W. of N. Direction Is., off Lookout Point; 20 fms; 9.iii.1929 (1 ovig. female): Stn. XIX, dredge; about ½ mile N. of Eagle Is., off Lookout Point; 10 fms; 10.iii.1929 (1 ovig. female): Low Isles – reef flat at low tide; 1928; no specific habitat (2 miles). Batt Reef, near Low Isles; low tide; 1928 (1 male).

Distribution. Indo-Pacific region; from Red Sea, E. Africa and Mauritius to China and southern Japan, Micronesia, W. and N.E. Australia, New Caledonia, Fiji and Hawaii.

Remarks: The young female from Batt Reef has less prominent spinulation on the postero-lateral regions and the margins of the carapace than the other recorded specimens. The general spinulation of the carapace is also reduced, giving the impression of wear. Unfortunately, the lower section of the deflexed rostrum is broken and missing but the specimen has the essential characters of the species and cannot be separated.

Genus ***ONCINOPUS*** de Haan, 1839
Oncinopus aranea de Haan

Inachus (*Oncinopus*) *aranea* de Haan (1833-50), pt. iv 1839, p. 100, pls. H and xxix, fig. 2.
Oncinopus aranea: Alcock, 1895, p. 188 (syn. & earlier refs.); Calman, 1900, p. 34 (syn. & refs.); Sakai, 1938, pp. 206, 353, pl. xxi, fig. 3, text fig. 3 (syn. & refs.).

Localities: Stn. IX, dredge; Penguin Channel, between Snapper Is. and Cape Kimberley; 12–14 fms; 22.ii.1929 (1 female): Stn. XXIV, dredge; ¾ mile N.E. of Pasco Reef, near Two Isles, E. of Lookout Point; 16½ fms; 13.iii.1929 (1 female, ovig.).

Distribution: Indo-Pacific tropical and warm temperate regions; ranges from Indian seas and Ceylon to southern Japan, Malay Archipel., Arafura Sea, N. Australia, Torres Strait, E. and S. Australia, and eastwards to New Hebrides and Hawaii.

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*Buitendijk also deals with *M. platipes* Rüppell (pp. 254, 256), which she shows is not a synonym of the above species, as was generally believed; this author gives full discussion, references and figures.

Genus *HYASTENUS* White, 1847
Hyastenus oryx A. M. Edwards

Hyastenus oryx A. M. Edwards, 1872, p. 250, pl. xiv, fig. 1: de Man, 1887a, p. 224, pl. vii, fig. 2 (refs.); Alcock, 1895, pp. 207, 214 (syn. & earlier refs.); Buitendijk, 1939, p. 244, text figs. 11-12 (ref.).
Hyastenus (Chorilia) oryx: Miers, 1884, pp. 195, 522 (refs.).

LOCALITIES: Stn. XIV, dredge; about ½ mile W. of N. Direction Is., off Lookout Point; 20 fms; 9.iii.1929 (1 male, 2 females): dredged off Low Isles; 9-12 fms; 17.x.1928 (2 males, 1 female – including the largest specimen of the series, a male measuring 15·5 mm between the tips of the postero-lateral spines).

DISTRIBUTION: Ranges from western Indian Ocean (Providence Is., near Madagascar) to Indian seas, W. and N.W. Australia, Philippines, China seas, Malay Archipel., Torres Strait, N.E. Australia and New Caledonia.

Genus *CAMPOSCIA* Latreille, 1829
Camposcia retusa Latreille

Camposcia retusa: Alcock, 1895, p. 184 (earlier refs.); Sakai, 1938, p. 228, pl. xxiii, fig. 3 (colour), text figs. 18a-b (refs.); Barnard, 1950, pp. 11, 12, text fig. 1 (refs.).

LOCALITIES: General Survey – Low Isles; Anchorage Reefs; area A4 on published key chart; 10.iv.1929 (1 female): Low Isles; reef at low tide; no specific habitat (1 male, 1 female).

DISTRIBUTION: Ranges widely in Indo-Pacific, mainly in tropical region – E. Africa and Red Sea to Indian seas and southern Japan, Malay Archipel., W. and N.E. Australia, and eastwards to Samoa and Fiji.

REMARKS: Examples from coral reefs of the N.E. Australian coast are often found heavily camouflaged with colourful fragments of sponge, with or without dead pieces of *Halimeda* weed and other reef debris.

Genus *CRIOCARCINUS* H. M. Edwards, 1834
Criocarcinus superciliosus (Herbst)

Criocarcinus superciliosus: A. M. Edwards, 1872, p. 242, pl. 12, fig. 3 (syn. & earlier refs.); Alcock, 1895, p. 247 (syn. & refs.); Sakai, 1938, pp. 251, 355, text fig. 26 (syn. & refs.).

LOCALITY: Low Isles – reef flat at low tide; 1928 (1 female).

DISTRIBUTION: Indo-south-west-Pacific region, from Andaman Islands to southern Japan, south to Malay Archipel., N.E. Australia and New Caledonia.

An additional example of this species from the N.E. Australian coast (dried carapace; greatest width 21·5 mm) in the Australian Museum collection is from Green Is., off Cairns.

It is believed that this species has not previously been recorded from Australian coastal waters.

Genus *HUENIA* de Haan, 1839
Huenia proteus (de Haan)

Huenia proteus: Borradaile, 1903, p. 686, pl. xlvii, figs. 1a, 1b, 2; text fig. 124 (refs.); Barnard, 1950, p. 41, text figs. 9a-f (syn. & full refs.).
[Not *H. proteus* Hale, 1927, p. 133, photo – male and female, fig. 132; McNeill, 1923, p. 244, photo.]

LOCALITY: Stn. XIX, dredge; about ½ mile N. of Eagle Is., off Lookout Point; 10 fms; rich *Halimeda* seaweed; 10.iii.1929 (1 male, 1 female).

DISTRIBUTION: Ranges widely in Indo-Pacific region – E. Africa to China and southern Japan, Micronesia, W., N. and N.E. Australia, and eastwards to Fiji and Hawaii.

REMARKS: Records from S. Australia (Hale, 1927) are not referable to de Haan's *H. proteus*, but appear to be an undescribed form of the genus. This novelty was recognized early this century by the late A. R. McCulloch and recorded by him in manuscript notes left in the Australian Museum.

The present author's 1923 record and photograph based on an ovigerous female specimen in the Australian Museum collection from Batt Reef, near Low Isles was, at that time, incorrectly identified. After re-examination, the specimen was submitted to D. J. G. Griffin, University of Tasmania, for his valued opinion. He considers that it approaches *Planotergum* Balss (1935, p. 147) and *Anomalopisa* Johnson (1965, p. 174, now = a synonym of *Planotergum*).

Family **HYMENOSOMATIDAE**
Genus ***ELAMENA*** H. M. Edwards, 1837
Elamena truncata (Stimpson)

Elamena truncata: Kemp, 1917, p. 272, text figs. 22, 23 (syn. & refs.); Tesch, 1918, pp. 20, 22, pl. i, figs. 4-4c (syn. & refs); Sakai, 1938, pp. 201, 353, pl. xx, fig. 3 (full refs.).

LOCALITIES: General Survey – Low Isles; Inner Rampart; area IR17 on published key chart; 22.iii.1929 (1 male, 1 female): Boulder Tract; area B2 on published key chart (1 male, 1 female): between Anchorage Reefs and Tripneustes Spit; 11.iv.1929 (1 male): Low Isles; several areas over reef system (3 males, 4 females; largest a male with carapace 7·5 mm wide).

DISTRIBUTION: Ranges from Indian seas to southern Japan, through the Malay Archipel. to N.E. Australia and New Caledonia. There is also a record of occurrence from South Australia (Hale, 1927, p. 119, fig. 117).

REMARKS: The species was not uncommon on the undersides of conglomerate slabs and boulders near the Inner Rampart in the south-eastern quarter of the reef system, sheltering in fine filamentous algae whenever this was present. Females were noted to have a more bulky body than males, but the latter were rendered conspicuous by their heavier chelae.

This species has not previously been recorded from Queensland waters.

Family **PARTHENOPIDAE**
Genus ***ZEBRIDA*** White, 1847
Zebrida adamsii White

Zebrida adamsii: Alcock, 1895, p. 287 (syn. & refs.); Rathbun, 1910a, p. 321 (ref.); Sakai, 1938, pp. 347, 360 (syn. & refs); Serène and Rominohtarto, 1963, p. 7, text fig. 4, pl. 2, figs. D, E (syn. & refs.).
Zebrida longispina Haswell, 1880, p. 454, pl. xxvii, fig. 3.

LOCALITY: Stn. XX, dredge; about $\frac{1}{4}$ mile N. of Eagle Is., off Lookout Point; 6 fms; 10.iii.1929 (2 females).

DISTRIBUTION: Tropical Indo-west-Pacific region; ranging from India and Ceylon to Siam and southern Japan, the Malay Archipel., Torres Strait and N.E. Australia.

REMARKS: Haswell stated that his species *Z. longispina*, which was established with a query, is distinguished from *Z. adamsii* "by having all the spines longer and more acute". His holotype, in the Macleay Museum, University of Sydney, is from Darnley Island, Torres Strait, and now has the entire front with the rostral horns broken off and missing. In all other respects it, and the figure prepared from it, clearly show the prominent spinulation which Haswell recorded as characteristic of this form. This spinulation, although stronger than that shown in White's figure (Adams & White, 1848–49, p. 24, pl. vii, fig. 1, in colour) of *Z. adamsii*, is considered merely a variation appearing to depend both on size and sex. The present author thus agrees with Alcock in reducing Haswell's species to synonymic rank. This decision is supported by a recent examination of several other

specimens of *Z. adamsii* in the Australian Museum from Queensland waters as far south as Moreton Bay. These agree closely with White's figure of his species. In addition it is interesting to note that the distinctive striped colour pattern shown in the *Samarang* colour figure is present on all specimens examined, including the holotype of *Z. longispina* in the Macleay Museum.

Genus ***PARTHENOPE*** Weber, 1795
Subgenus ***RHINOLAMBRUS*** A. M. Edwards, 1878
Parthenope (Rhinolambrus) longispinis (Miers)

Lambrus spinifer Haswell, 1880, p. 451, pl. xxvii, fig. 1.
Lambrus (R.) longispinis: Alcock, 1895, pp. 265, 266 (syn. & earlier refs.); Rathbun, 1924, p. 8 (syn. & refs.); Sakai, 1938, pp. 333, 359, pl. xxxix, fig. 2 (syn. & refs.).

Localities: Stn. IX, dredge; Penguin Channel, between Snapper Is. and Cape Kimberley; 12–14 fms; 22.ii.1929 (1 ovig. female): Stn. XIII, dredge; ½ mile west of Two Isles, off Cape Flattery; 16½ fms; 7.iii.1929 (1 juvenile female): off Low Isles; dredged in 9–12 fms; 17.x.1928 (1 juvenile male, the smallest example collected – carapace 7 mm wide).

Distribution: Ranges widely in warmer waters of Indo-Pacific region, from Indian seas, north to southern Japan, and south to the Malay Archipel., Australia, and as far east as Samoa.

Remarks: Small juvenile examples of this species possess longer and more slender chelipeds than adults; spinulation of the carapace is much more marked, and the very slender ambulatory limbs may be quite free of any rugged armature.

Parthenope (Rhinolambrus) pelagicus (Rüppell)

Lambrus affinis A. M. Edwards, 1872, p. 261, pl. xiv, figs. 4, 4a-c.
Lambrus (R.) pelagicus: Alcock, 1895, pp. 265, 267 (syn. & refs.); Sakai, 1938, pp. 333, 335, 359, pl. xli, fig. 4 (syn. & refs.).
Parthenope pelagica: Whitley and Boardman, 1929, p. 371, illustr.

Localities: Stn. XIX, dredge; about ½ mile N. of Eagle Is., off Lookout Point, near Cape Flattery; 10 fms; 10.iii.1929 (1 young female): Low Isles; S.E. quarter of the Mangrove Park, amongst *Cymodocea* weed on sand (1 male, 1 female – carapaces 21·5 and 17·5 mm wide respectively): from pond outside mangroves; 11.iii.1929 (1 young male).

Distribution: Ranges widely in warmer regions of Indo-west-Pacific – Red Sea and E. Africa to southern Japan, N. and N.E. Australia and New Caledonia.

Remarks: Male specimens exhibit slight variation in the length and bulk of the chelipeds. Whitley and Boardman's illustration is from a Low Isles specimen taken during their participation in the activities of the Great Barrier Reef Expd.

Subgenus ***AULACOLAMBRUS*** Paulson, 1875
Parthenope (Aulacolambrus) hoplonotus (Adams & White)

Lambrus hoplonotus Adams and White, 1848-1849, p. 35, pl. vii, fig. 3.
Lambrus (A.) hoplonotus: Alcock, 1895, pp. 272, 273 (syn. & refs.).

Locality: Stn. XIX, dredge; about ½ mile N. of Eagle Is., off Lookout Point, near Cape Flattery; 10 fms; 10.iii.1929 (1 young female).

Distribution: Ranges in tropical Indo-Pacific waters from Ceylon to Malay Archipel., Australia, New Caledonia, and as far eastwards as Hawaii.

Remarks: As with other parthenopids, the rostrum of this species may sometimes exhibit an indefinite triradiate shape, especially in young examples.

Genus *CERATOCARCINUS* Adams and White, 1848–1849

Considered by several authors to be synonymous with *Harrovia* Adams and White, 1849 – See Sakai, 1938, p. 350.

Ceratocarcinus dilatatus A. M. Edwards

Ceratocarcinus dilatatus A. M. Edwards, 1872, p. 256, pl. xiv, fig. 2: Rathbun, 1918, p. 29 (refs.); Hale, 1927, p. 143, fig. 146 (photo.); Flipse, 1930, p. 79 (refs.); Serène, van Duc and van Luom, 1958, pp. 170-173, 174-175, text fig. 4c (refs. & discussion).

LOCALITY: Stn. XVI, dredge; about ½ mile W. of N. Direction Is., off Lookout Point; 20 fms; 9.iii.1929 (1 male, 1 female).

DISTRIBUTION: Present records confine the species to a restricted area from Malay Archipel. to N.E. Australia and New Caledonia.

Although this species is an old established one, its records in literature are few. The present record appears to be only the fifth published mention of the species and the third record from the coastal waters of N.E. Australia.

Family **PORTUNIDAE**

Genus *SCYLLA* de Haan, 1833

Scylla serrata (Forskål)

Scylla serrata: Alcock, 1899, p. 27 (syn. & earlier refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 42, 61; Sakai, 1939, pp. 384, 708, text fig. 4 (refs., recent liter.); Stephenson and Campbell, 1960, p. 111, pl. 4, fig. 4, pls. 5N, 6C, text fig. 2N (syn., refs. and discussion).

LOCALITY: General Survey – Low Isles; the Shingle Rampart, south of the Mangrove Swamp (1 adult male, cast shell).

DISTRIBUTION: Indo-Pacific region generally, in both tropical and warm temperature waters; ranges from E. Africa, Mauritius, Madagascar, Red Sea, Indian seas, Asiatic coasts to southern Japan, Malay Archipel., Australia, New Caledonia, New Zealand (see Dell, 1964a, p. 59, photo.), and Oceania generally to Hawaii and Tahiti.

REMARKS: Whitley and Boardman (1929, p. 373, photo) give notes on, and a photograph of, a burrow on Low Isles in coral shingle attributed to this species. On the basis of the cast shell listed above the present author is convinced that the burrow is correctly associated.

Genus *THALAMITA* Latreille, 1829

Thalamita squamosa Stephenson and Hudson

Thalamita squamosa Stephenson and Hudson, 1957, pp. 320, 355, pl. v, fig. 4; pl. 8, fig. Q; pl. 10, fig. j; text figs. 2K, 3K.

LOCALITY: No locality details were found with the specimens. The series was no doubt dredged at one of the Expedition's Stations, which were concentrated in an area to the north of Low Isles at points generally eastward of Lookout Point (three males, six females; comprising Holotype – Register No. B.M.(N.H.)1967.8.9:2, Allotype, and seven Paratypes).*

DISTRIBUTION: Known only from N.E. Australia.

REMARKS: The material on which this species was based was released by the author so that it could be included by Stephenson and Hudson in their revision of the species of *Thalamita* in Australian waters. All the type specimens, plus a small number of segregated fragmented legs, are lodged in the British Museum with the other Expedition Decapoda, and are accompanied by labels with the alphabetical symbols allotted to them by the authors of the species.

*Some paratypes will be returned to Australian Museum.

Thalamita chaptali (Audouin & Savigny)

Thalamita chaptalii: Alcock, 1899, pp. 74, 80 (syn. & refs.); Rathbun, 1910, p. 365, fig.; Stephenson and Hudson, 1957, pp. 318, 319, 327, pl. 1, fig. 3, pl. 7, fig. C, pl. 10, fig. B, text figs. 2F, 3F (syn. & refs.).

Localities: General Survey – Low Isles; the Sand Flat; 20.iv.1929 (1 male): Stn. XIV, dredge; ½ mile S.E. of Lizard Is., off Lookout Point; 19 fms; 7.iii.1929 (2 carapaces and 1 damaged chela; largest carapace approximately 18 mm wide, including antero-lateral spines): Stn. XVI, dredge; about ½ mile W. of N. Direction Is., off Lookout Point; 20 fms; 9.iii.1929 (7 males, 4 females – including juveniles of both sexes; width of carapaces, including antero-lateral spines, ranging from 9 mm to 20 mm): Stn. XVII, dredge; about ¼ mile N. of N. Direction Is.; 19 fms; 9.iii.1929 (9 males, 10 females – including juveniles; width of carapaces, including antero-lateral spines, ranging from 20 mm to 26 mm); Low Isles; reef flat generally, under flat conglomerate boulders; no specific habitats (1 male, 4 females – largest a male with carapace 17 mm wide): off Low Isles, dredged 12 fms; 16.x.1928 (1 juvenile male; width of carapace 8·5 mm).

Distribution: Predominantly tropical in Indo-west-Pacific region – occurs at Madagascar, Mauritius, Red Sea, Ceylon, Andamans, Gulf of Siam, N.E. Australia, Lord Howe Is. in the S. Pacific, New Caledonia, the Solomon Islands and Tahiti.

The series from Stn. XVII exhibits variable distinctness of the median frontal notch.

Prior to 1957 (Stephenson and Hudson), this species had not been recorded from Australian waters. Considering its wide range of distribution, it is surprising that the total of earlier recordings is so small. The localities, New Caledonia and Solomon Islands, are now added to the list of records, based on specimens in the Australian Museum collection.

Stephenson and Hudson examined and named all the dredged examples of the species listed here, but they recorded only two of the localities in their published work.

Thalamita inhacae Barnard

Thalamita inhacae Barnard, 1950, p. 179, text fig. 33g: Stephenson and Hudson, 1957, pp. 317, 320, 337, pl. 3, fig. 2, pl. 7, fig. H, pl. 10, fig. E, text figs. 2L, 3L (ref.); Stephenson, 1961, p. 121 (ref.).

Localities: Stn. XIV, dredge; ½ mile S.E. of Lizard Is., off Lookout Point; 19 fms; 7.iii.1929 (1 male, carapace only, 10 mm wide – referred to by Stephenson and Hudson as "specimen B"): Stn. XVI, dredge; about ½ mile W. of N. Direction Is., off Lookout Point; 20 fms; 9.iii.1929 (2 females, each with carapace 8 mm wide – referred to by Stephenson and Hudson as "specimen C" and "specimen D"): Stn. XVII, dredge; about ¼ mile N. of N. Direction Is.; 19 fms; 9.iii.1929 (1 female, 14 mm wide; 1 female, 13 mm wide; 2 males, each 10 mm wide – referred to respectively by Stephenson and Hudson as "specimens E, F, G, H").

Distribution: Known from S.E. Africa, W. Australia, eastern Australian coast from tropical to temperate waters, and Lord Howe Is. in S. Pacific, off N.S. Wales coast.

Remarks: The Australian records by Stephenson and Hudson constitute the first recognition of the species from the waters of that Continent. The same authors were also responsible for the identification of the specimens reported upon here, and recorded similar but less detailed localities in their published work. They commented upon the fact that *T. inhacae* was based upon a single female, making it impossible for them to carry out a critical comparative study of male pleopods. The authors state that "until such a comparison can be made on topotypical material, a slight doubt must exist as to whether the present species is *T. inhacae* or an undescribed form".

Thalamite admete (Herbst)

Thalamite admeta: Alcock, 1899, pp. 74, 82 (syn. & earlier refs.).
Thalamita dispar Rathbun, 1914, p. 657, pl. 2, fig. 4.
Thalamita admete: Stephenson, Stephenson, Tandy and Spender, 1931, pp. 44, 59; Stephenson and Hudson, 1957, pp. 319, 320, pl. 1, fig. 1, pl. 7, fig. A, pl. 10, fig. A, text figs. 2 *I*, 3 *I*, 5 (syn.* & full refs.); Stephenson, 1961, p. 117 (syn. & refs.).

Localities: Low Isles – The species was one of the most common and widely dispersed decapods of the reef system; no other species of *Thalamita* was nearly so abundant. 18 males and 12 females bear labels linking them with the General Survey. An additional 10 males and 8 females (largest a male measuring 25 mm between the tips of the postero-lateral spines) from the reef flat generally, are without specific habitats. The following typical habitats in the General Survey will serve to emphasize the wide distribution of the species at the locality and in adjacent waters.

Reef flat; area F9 on published key chart; 4.iv.1929 (1 male, 3 ovig. females): between Anchorage Reefs and Mangrove Park; 10.iv.1929 (1 ovig. female): Tripneustes Spit; 21.iii.1929 (3 males, 3 ovig. females): between Anchorage Reefs and Tripneustes Spit; 11.iv.1929 (1 female): Inner Rampart in area IR17 on published key chart and Mangrove Park; 18.iv.1929 (1 female): Boulder Tract; area G on published key chart (3 males, 1 female). Batt Reef, near Low Isles (1 female, carapace 30·5 mm wide). Three Isles, N. of Cape Bedford; from similar widely dispersed habitats to those listed for Low Isles; May, 1929 (3 males, 2 ovig. females).

Distribution: Ranges widely in Indo-Pacific region, mainly tropical but disposed in parts to penetrate temperate waters – E. Africa, Madagascar, Red Sea and throughout Indian Ocean to southern Japan, Micronesia, Malay Archipel., Australia and generally eastwards to Hawaii, Fiji and Tahiti.

Thalamita stimpsoni A. M. Edwards

Thalamita stimpsoni: Alcock, 1899, pp. 73, 79 (earlier refs.); Sakai, 1939, pp. 413, 416, 710 (syn. & refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 44, 54; Stephenson and Hudson, 1957, pp. 317, 320, 356, pl. 6, figs. 1-3, pl. 8, fig. R, pl. 9, fig. I, text figs. 2M, 3M (syn. & refs.).
[Not *T. stimpsoni* Sakai, 1934, p. 304, and McNeill, 1926, p. 307 = *T. prymna* (Herbst).]

Localities: General Survey – Low Isles; between Anchorage Reefs and Mangrove Park; 10.iv.1929 (1 juvenile male): in area F9 on published key chart; 4.iv.1929 (1 juvenile male): Low Isles; the Thalamita Flat; Sept.–Oct., 1928 (10 males, 7 females): Snapper Is., near Low Isles; 26.viii.1928 (1 male, 1 female): Three Isles, north of Cape Bedford; reef (1 female).

Distribution: Ranges widely in Indo-west-Pacific region, predominantly tropical – from Red Sea to Indian seas and southern Japan, Malay Archipel., W., N. and E. Australia, New Caledonia, Lord Howe Is. in the S. Pacific, and eastwards to Samoa.

Remarks: The species is the most conspicuous of its genus along the Great Barrier Reef. It is invariably found on the open expanses of reef tops where conglomerate slabs and boulders abound.

During the British Expedition's occupation of Low Isles, Anne Stephenson (1934, pp. 248, 264) made some interesting observations of the breeding behaviour of this species.

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*Crosnier (1962, p. 98, text fig. 158) records *T. edwardsi* Borradaile as a valid species, and not a synonym of *T. admete* as claimed by Stephenson and Hudson (1957).

Thalamita crenata Latreille

Thalamita crenata: Alcock, 1899, pp. 73, 76 (syn. & earlier refs.); Stimpson, 1907, p. 84, pl. x, figs. 6-6a; Stephenson, Stephenson, Tandy and Spender, 1931, pp. 38, 42; Sakai, 1939, pp. 413-415, 710, pl. lxxxiv, fig. 3 (refs.); Stephenson and Hudson, 1957, pp. 316, 317, 320, 332, 362, 363, 364, pl. 2, fig. 3; pl. 7, fig. F, pl. 9, fig. C, text figs. 2Q, 3Q1-2 (syn. & refs.).
[Not *T. crenata* Dana, 1852 = *T. danae* Stimpson].

LOCALITIES: General Survey – Low Isles; the Mangrove Swamp, in area IM1 on published key chart; 5.iv.1929 (2 males, 1 female): Earthworm Spit, in area IM4B on published key chart (1 female): Low Isles – reef flat at low tide; 1928; no specific habitat (1 young female): Three Isles, N. of Cape Bedford; 6.v.1929 (1 female).

DISTRIBUTION: Ranges widely in Indo-Pacific region, predominantly tropical – from Red Sea, E. Africa and Madagascar northwards as far as coasts of China and southern Japan, southwards to W., N. and E. Australia, and eastwards to Samoa and Marquesas.

HABITAT: At Low Isles the species showed preference for habitats where weed growths occurred in shallows on sandy areas in protected spots. Such areas were close to the inner margin of the Mangrove Swamp, and well away from more exposed parts of the reef flat where the terrain was more rugged and irregular in character. See similar comments on Low Isles examples by Whitley and Boardman (1929, p. 373).

Thalamita coeruleipes Jacquinot

Thalamita coeruleipes: A. M. Edwards, 1861, pp. 363, 367 (ref.); Stephenson and Hudson, 1957, pp. 316, 320, 329, pl. 2, fig. 1, pls. 7D, 9B, text figs. 2P, 3P (refs.); Stephenson, Endean and Bennett, 1958, pp. 269, 288, 300; Forest and Guinot, 1961, pp. 8, 32 (refs.); Crosnier, 1962, pp. 95, 128, pl. xi, fig. 2, text fig. 219 *bis* a-b (refs.).

LOCALITY: Low Isles; two specific habitats; an additional record from the locality subsequent to the British Great Barrier Reef Expd. of 1928–29.

DISTRIBUTION: Ranges widely in tropical Indo-Pacific region – Madagascar, Mauritius, Malay Archipel., Carolines, N.E. Australia, Fiji, Hawaii, Tahiti and Tuamotu Islands.

Thalamita prymna (Herbst)

Thalamita prymna: Alcock, 1899, pp. 73, 76, 78 (syn. & earlier refs.); Calman, 1900, p. 22 (refs.); Sakai, 1939, pp. 413, 416, 710, pl. li, fig. 1 (refs.); Stephenson and Hudson, 1957, pp. 316, 320, 346, pl. 4, fig. 3, pl. 8, fig. L, pl. 9, fig. E, text figs. 2R, 3R (syn. & full refs.).

LOCALITY: Off Low Isles; dredged 12 fms; 16.x.1928 (1 juvenile male; width of carapace, including antero-lateral spines, 12 mm): Low Isles; Madrepore Moat; from among branches of dead growth; Oct., 1928 (1 juvenile female).

DISTRIBUTION: Tropical and temperate Indo-west-Pacific, including E. Africa, Madagascar, Red Sea, southern Japan, Marshall Islands, Java, New Guinea, New Caledonia, W., N. and E. Australia, Lord Howe Is. in the S. Pacific, Samoa, Hawaii and Tahiti.

Thalamita sexlobata Miers

Thalamita sexlobata: Alcock, 1899, pp. 75, 87 (refs.); var. ?, de Man, 1902, p. 651, pl. xxi, fig. 29 (refs.); Stephenson and Hudson, 1957, pp. 316, 319, 350, pl. 5, fig. 1, pl. 8, fig. N, pl. 10, fig. K, text figs. 2B, 3B (syn. & refs.).

LOCALITY: Stn. XVI, dredge; about ½ mile W. of N. Direction Is., off Lookout Point; 20 fms; 9.iii.1929 (1 juvenile male, 2 females; width of carapaces, including antero-lateral spines, ranging from 8·5 to 12 mm).

DISTRIBUTION: Tropical Indo-west-Pacific – Madagascar and Persian Gulf to N.E. Australia.

The Australian records by Stephenson and Hudson (1957) constitute the first recognition of the species from the waters of that Continent. The same authors were responsible for the identification of the specimens here recorded, and they also briefly recorded the same locality in their published work.

Thalamita sima H. M. Edwards

Thalamita sima: Miers, 1884, pp. 231, 539 (full distrib.); Alcock, 1899, pp. 74, 81 (syn. & earlier refs.); Sakai, 1939, pp. 414, 422-3, 711, pl. li, fig. 3, text figs. 16a-c (syn. & refs.); Stephenson and Hudson, 1957, pp. 318, 319, 352, pl. 5, fig. 2, pl. 8, fig. o, pl. 9, fig. G, text figs. 2C, 3C 5 (syn. & full refs.).
"*Thalamita sima* ?": Stimpson, 1907, p. 83, pl. xi, fig. 2.

LOCALITIES: Stn. XVII, dredge; about ¼ mile N. of N. Direction Is., off Lookout Point; 19 fms; 9.iii.1929 (2 males – one a juvenile; width of carapaces, including antero-lateral spines, 11 and 23 mm): Stn. XIII, dredge; ½ mile W. of Two Isles, off Cape Flattery; 16½ fms; 7.iii.1929 (1 juvenile female; width of carapace, including antero-lateral spines, 10·5 mm): Stn. XIX, dredge; about ½ mile N. of Eagle Is., off Lookout Point; 10 fms; 10.iii.1929 (1 juvenile female; width of carapace, including anterolateral spines, 8 mm).

DISTRIBUTION: Indo-Pacific region, from Red Sea and east coast of Africa, Madagascar, to China, southern Japan, and eastwards to Hawaii, including tropical and temperate Australian waters. Although Stephenson and Hudson (1957) repeat an early record by Miers from the New Zealand area, this species has been specifically excluded from that fauna by Bennett (1964, p. 14).

In the author's opinion the illustration given by Stimpson (1907) for a queried Hongkong record of this species faithfully portrays the above portunid.

Stephenson and Hudson (1957) have examined all examples of the species listed here, and briefly recorded the localities for them in their published work.

Thalamita spinimana Dana

Thalamita spinimana Dana, 1852, p. 283; 1855, pl. 17, figs. 8a-c: de Man, 1887-1888, p. 76, pl. iv, fig. 7 (refs.); Stephenson and Hudson, 1957, pp. 316, 320, 354, pl. 5, fig. 3, pl. 8, fig. P, pl. 9, fig. H, text figs. 2 *O*, 3 *O* (refs.).

LOCALITIES: General Survey – Low Isles; reef flat; *Cymodocea* bottom in area F8 on published key chart; 4.iv.1929 (1 female): Low Isles – reef flat at low tide; 1928; no specific habitat (1 female, ovig.).

DISTRIBUTION: Although records of the species are few, it ranges over a wide area of the tropical Indo-Pacific region. Examples have been recorded from the Mergui Archipel., Malay Archipel., N.E. Australia, New Caledonia and Fiji.

Genus ***CHARYBDIS*** de Haan, 1833

Charybdis obtusifrons Leene

Charybdis (*Goniosupradens*) *obtusifrons* Leene, 1938, pp. 24, 140, text figs. 85-87 (syn. & refs.): Crosnier, 1962, p. 84, text figs. 146, 146 *bis* a-c (refs.).
Charybdis obtusifrons: Sakai, 1939, pp. 398, 399, 409, pl. lxxxiii, fig. 3 (syn. & refs.).

LOCALITY: Yonge Reef (Lat. 14°35′S.), eastern edge of Great Barrier Reef, under stones on reef crest (1 male, 59 mm wide between the tips of the posterior pair of lateral spines).

DISTRIBUTION: The limited present known occurrence is – Madagascar, Red Sea, southern Japan, N.E. Australia.

REMARKS: This specimen was earlier given the identification of *C. orientalis*, presumably by an authority in the British Museum, and it was listed under that name by Stephenson, Stephenson, Tandy and Spender (1931, p. 86). At that time Leene's description of *C. obtusifrons* (1936, p. 124, figs. 11–12) had not been published, and the name *C. orientalis* could reasonably have been considered adequate. The two species are very similar in general appearance, but a close examination of Leene's (1938) full description and figures leaves no doubt about the identification recorded here. All that can be added to the description is that the present adult male has the spine on the distal end of the carpus of the cheliped, immediately above the base of the movable finger, more strongly developed than in Leene's figure of the female holotype.

The present record greatly extends the known range of the species and is the first from Australian waters.

Genus ***PORTUNUS*** Weber, 1795

Portunus pelagicus (Linnaeus)

Neptunus pelagicus: Alcock, 1899, pp. 31, 34 (syn. & earlier refs.).
Neptunus (*N.*) *pelagicus:* Sakai, 1939, pp. 385, 387, 709, pl. xlix (syn. & refs.).
Lupa pelagica: Barnard, 1950, pp. 152, 153, text fig. 27b (syn. & full refs.).
Portunus pelagicus: Stephenson and Campbell, 1959, pp. 91, 96, 117, 118, 119, pl. 1, fig. 1, pls. 4A, 5A, text figs. 2A, 3A (syn. & refs.).

LOCALITIES: Low Isles; Sand flat, along edge of Thalamita Flat; under eroded conglomerate slabs in small shallow pools (4 juvenile males, measuring from 10 mm to 24 mm between the tips of the elongated lateral spines): off Low Isles; 12 fms; dredge; 16.x.1928 (1 juvenile male). Batt Reef, near Low Isles; from shallow sand-floored pools; 13.ix.1928 (1 juvenile male, measuring 40 mm between the tips of the lateral spines).

DISTRIBUTION: Ranges extensively in tropical as well as temperate waters of the Indo-Pacific region – E. Africa, Madagascar, Red Sea, Persian Gulf to Indian seas and southern Japan, Malay Archipel., Micronesia, N., E. and S. Australia, and eastwards to New Zealand (see Dell, 1964, p. 303, photos) and Tahiti. The species has also penetrated to the eastern Mediterranean.

Portunus argentatus (A. M. Edwards)

Neptunus (*Amphitrite*) *argentatus:* Alcock, 1899, pp. 31, 36 (syn. & earlier refs.); Sakai, 1939, pp. 386, 390, 391, 709, pl. lxxxi, fig. 1, text fig. 5b (syn. & refs.).
Portunus argentatus: Stephenson and Campbell, 1959, p. 90 (syn. note and chars. in key); Stephenson, 1961, p. 105, pl. 2, fig. 2, pls. 4D, 5A, text figs. 1F, 3D (syn. & refs.); Crosnier, 1962, pp. 48, 50, 52, 53, text figs. 71, 75, 77, 80, 81, pl. III, fig. 1 (syn. & refs.).

LOCALITY: Stn. V, Agassiz Trawl; Linden Bank, N. side seaward entrance Trinity Passage, E. of Cairns; 37 fms; 24.xi.1928 (1 male).

DISTRIBUTION: Widely distributed in Indo-Pacific region – E. Africa, Madagascar, Red Sea, Indian seas to southern Japan, the Malay Archipel., W. and N.E. Australia, and eastwards to Hawaii.

The present record constitutes the second known recognition of the species from Australian waters, and extends its known range there from the western to the north-eastern quarter of the Continent.

Portunus gracilimanus (Stimpson)

Neptunus (Lupocycloporus) whitei: Alcock, 1899, pp. 32, 44 (syn. & ealier refs.).
Lupa whitei: Grant and McCulloch, 1906, p. 19 (syn. & ref.).
Amphitrite gracilimanus: Stimpson, 1907, p. 77, pl. x, fig. 3 (ref.).
Portunus gracilimanus: Stephenson and Campbell, 1959, pp. 89, 91, 115, pl. 4, fig. 1, pls. 4 M, 5 M, text figs. 2 M, 3 M (syn. & refs.).

LOCALITY: Off Low Isles; Agassiz Trawl; 12 fms; sand and mud bottom; 16.x.1928 (1 female, measuring 40 mm between tips of produced postero-lateral spines).

DISTRIBUTION: Indian seas to south China coast, the Malay Archipel. and N.E. Australia.

Portunus granulatus (H. M. Edwards)

Neptunus (Achelous) granulatus: Alcock, 1899, pp. 32, 45 (syn. with exception of *Amphitrite gladiator* - full earlier refs.); Sakai, 1939, pp. 386, 397, 709, pl. lxxxi, fig. 3, text fig. 8b (syn. & refs.).
Portunus granulatus: Stephenson and Campbell, 1959, pp. 91, 108, 117, 119, pl. 3, fig. 1, pls. 4 *I*, 5 *I*, text figs. 2 *I*, 3 *I* (syn. & refs.); Stephenson, 1961, p. 108 (ref.); Crosnier, 1962, pp. 56, 58, 59, text figs. 89, 92, 94a-b (syn. & refs.).

LOCALITIES: Low Isles; the Sand Flat, along edge of Thalamita Flat; under eroded conglomerate slabs in small shallow pools (4 males, 1 female – largest a female with carapace 29 mm wide). Batt Reef, near Low Isles; 13.ix.1928 (1 male with carapace 31 mm wide).

DISTRIBUTION: Ranges widely in Indo-Pacific region, predominantly tropical – E. Africa, Madagascar, Red Sea, Persian Gulf to Indian seas and southern Japan, Micronesia, Malay Archipel., N.W. to N.E. Australia, New Caledonia, and eastwards to Hawaii and Tahiti.

Portunus hastatoides Fabricius

Neptunus (Hellenus) hastatoides: Alcock, 1899, pp. 31, 38 (syn. & earlier refs.); Sakai, 1939, pp. 386, 391, 709, pl. xlvii, fig. 1 (syn. & refs.).
Hellenus hastatoides: Barnard, 1950, p. 158, text figs. 30e-g (syn. & refs.).
Portunus hastatoides: Stephenson and Campbell, 1959, pp. 92, 101, 118, pl. 1, fig. 4, pls. 4D, 5D, text figs. 2D, 3D (syn. & refs.); Crosnier, 1962, pp. 59, 64, 67, 68, text figs. 96, 109, 117, 122-3 (syn. & refs.).

LOCALITIES: Low Isles; the Sand Flat, along edge of Thalamita Flat; under eroded conglomerate slabs in small shallow pools (1 juvenile male, 1 ovig. female – measuring respectively about 18·5 mm and 28 mm between the tips of antero-lateral spines; one spine missing from male specimen): $\frac{3}{4}$ mile S.E. of Low Isles; 13 fms; Agassiz Trawl; 17.x.1929 (3 males, 1 female).

DISTRIBUTION: Ranges widely in Indo-west-Pacific region, mainly tropical – E. Africa, Persian Gulf, Indian seas to southern Japan, the Malay Archipel., N. and N.E. Australia.

Portunus tenuipes (de Haan)

Neptunus (Hellenus) tenuipes: Alcock, 1899, pp. 31, 42 (syn. & earlier refs.).
Neptunus (Amphitrite) tenuipes: Sakai, 1939, pp. 386, 389, 709, pl. lxxx, fig. 2 (syn. & refs.).
Portunus tenuipes: Stephenson and Campbell, 1959, pp. 92, 103, pl. 2, fig. 1, pls. 4E, 5E, text figs. 2E, 3E (syn. & refs.).

LOCALITIES: Stn. XVI, dredge; about $\frac{1}{2}$ mile W. of N. Direction Is., off Lookout Point; 20 fms; 9.iii.1929 (1 female): Stn. XVII, dredge; about $\frac{1}{4}$ mile N. of N. Direction Is.; 19 fms; 9.iii.1929 (1 male, 2 females): Stn. XIX, dredge; about $\frac{1}{2}$ mile N. of Eagle Is., off Lookout Point; 10 fms; 10.iii.1929 (2 males, 2 females): Stn. XXII, dredge; to east of Snake Reef, near Howick Is., between Lookout Point and Cape Melville; $13\frac{1}{2}$ fms; 11.iii.1929 (1 female): Stn. XXIII, dredge; in lee of Turtle Isles,

near Lookout Point; 8 fms; 12.iii.1929 (1 male): off Low Isles; Agassiz Trawl; 9–12 fms; 17.x.1928 (1 juvenile female).

DISTRIBUTION: Ranges from eastern Indian seas to southern Japan, the Malay Archipel., N.W. and N.E. Australia.

The largest specimen in the series is an apparently fully adult male measuring 42 mm between the tips of the produced postero-lateral spines.

Genus *CARUPA* Dana, 1850

Carupa tenuipes Dana

Carupa laeviuscula: Alcock, 1899, p. 26 (earlier refs.); Sakai, 1939, pp. 373, 707, pl. xliv, fig. 3 (refs.).
Carupa tenuipes: Stephenson and Campbell, 1960, p. 88, pl. 2, fig. 1 (syn. & refs.); Crosnier, 1962, pp. 18, 19, text figs. 16-23, pl. I, fig. 1 (syn. & refs.).

LOCALITY: Low Isles; the Madrepore Moat; from interstices in basal branches of dead coral growth (1 male, 1 female – carapaces 17·5 mm and 19·5 mm wide respectively).

DISTRIBUTION: Ranges widely in warmer regions of the Indo-Pacific – Madagascar, Red Sea Indian seas, southern Japan, Philippines, N.E. Australia, thence eastwards to Hawaii.

The present record appears to be the second known recognition of the species from the Australian coast.

Genus *CAPHYRA* Guérin, 1832

Caphyra laevis (A. M. Edwards)

Caphyra laevis: A. M. Edwards, 1873, p. 173, pl. iv, figs. 2a-c (syn. & ref.): Grant and McCulloch, 1906, p. 18 (ref.); Leene, 1938, p. 9 (syn. & refs.); Stephenson and Campbell, 1960, p. 97, pl. 3, fig. 3, pl. 5 *I*, text figs. 1 *G*, 2 *I*, 3 *D-G*, 3 *J* (syn. & refs.); Crosnier, 1962, pp. 32, 33, text figs. 43a-b (syn. & refs.).

LOCALITIES: Low Isles; from colonies of the alcyonarian, *Xenia elongata;* reef flat at low tide (2 males, 1 female): Batt Reef, near Low Isles; from similar habitat; Oct. 1928 (1 male, 6 females – largest a female with carapace 20·5 mm wide).

DISTRIBUTION: Limited recordings over a wide range in Indo-Pacific region include Madagascar, Malay Archipel., N.E. Australia and New Caledonia.

REMARKS: The species is a commensal, always found among the polyps of the soft alcyonarian *Xenia elongata*, the colour pattern of which is reproduced on the anterior part of the carapace (see Gillett and McNeill, 1962, p. 122, photo pl. 122).

Caphyra yookadai Sakai

Caphyra yo-okadai: Sakai, 1939, p. 378, pl. xliii, fig. 4, text fig. 2 (refs.).
Caphyra yookadai: Stephenson and Campbell, 1960, pp. 97, 102, pl. 4, fig. 1, pl. 5 *K*, text figs. 1 *I*, 2 *K*, 3 *H* (syn. & refs.); Stephenson, 1961, p. 98, pl. 1, fig. 3 (refs.); Crosnier, 1962, p. 31, text figs. 40-43 (refs.).

LOCALITIES: Low Isles; reef flat; living on alcyonarian (1 male): "North of Low Isles" (No definite locality on label); 31.vii.1928; "with protective colouration; on alcyonarian" (1 male).

DISTRIBUTION: S. Africa (Barnard; in 1957 as *C. rotundifrons* – not *C. rotundifrons* A. M. Edwards, 1869); Madagascar; southern Japan (Sakai); Moreton Bay, Queensland (Stephenson and Campbell, 1960, and Stephenson, 1961); Low Isles, off Port Douglas, Queensland (present record).

Genus *LISSOCARCINUS* Adams and White, 1849
Lissocarcinus polybioides Adams and White

Lissocarcinus polybioides Adams and White, 1849, p. 46, pl. xi, fig. 5: Alcock, 1899, p. 19 (earlier refs.); Stephenson and Campbell, 1960, p. 94, pl. 3, fig. 1, pl. 5 H, text figs, 1 F, 2 H (full refs.); Crosnier, 1962, pp. 24, 25, 26, text figs. 29, 30 (refs.).

LOCALITIES: Stn. VIII, dredge; 1½ miles N.W. of Low Isles; 11 fms; 21.ii.1929 (1 female, ovig.): dredged off Low Isles; 12 fms; 16.x.1928 (1 female, ovig.).

DISTRIBUTION: Madagascar and Seychelles in Indian Ocean to Indian seas and southern Japan, Borneo, N.E. Australia and temperate E. and S. Australia.

Genus *LIBYSTES* A. M. Edwards, 1867
Libystes truncatifrons (de Man)

Goniocaphyra truncatifrons de Man, 1887a, p. 339, pl. xiv, fig. 1.
Goniocaphyra sp. Zehntner, 1894, p. 163, pl. 8, figs. 12-12a.
Catoptrus nitidus: Sakai, 1939, pp. 372, 707, pl. xliv, fig. 2 (syn. & full refs.).
[Not *Libystes nitidus* A. M. Edwards, 1868, p. 83, pl. 20, figs. 5-7.]
Libystes truncatifrons: Stephenson and Campbell, 1960, pp. 85, 86 (syn., key characters & ref.); Crosnier, 1962, p. 16 text figs. 11-16 (syn. & refs.).

LOCALITY: Low Isles; Madrepore Moat, from interstices at base of dead coral growth (1 male – carapace 11 mm wide).

DISTRIBUTION: Madagascar and Mauritius to Ceylon and southern Japan, Malay Archipel., and N.E. Australia.

The present record constitutes an addition to the Australian decapod fauna.

Family **XANTHIDAE**
Genus *ZOSIMUS* Leach, 1818
Zosimus aeneus (Linnaeus)

Zozymus aeneus: Alcock, 1898, p. 104 (syn. & full refs.); Sakai, 1939, pp. 450, 713, pl. lxxxviii, fig. 3 (refs.); Stephenson, Stephenson, Tandy and Spender, 1931, p. 86.
Zosimus aeneus: Barnard, 1950, p. 210, fig. 39a (syn. & refs.); Buitendijk, 1960, p. 284, text fig. 6a (syn. & refs.).

LOCALITY: Yonge Reef (Lat. 14°35′S.); reef crest, under boulders; 6.v.1929 (1 adult and 1 juvenile male).

DISTRIBUTION: A common tropical species of the Indo-Pacific region – Ranges from E. Africa and Red Sea to southern Japan, Malay Archipel., Australia, New Caledonia and to Hawaii, Tahiti and Tuamotu Islands.

Genus *XANTHIAS* Rathbun, 1897
Xanthias lamarckii (H. M. Edwards)

Xanthias lamarckii: Alcock, 1898, p. 157 (syn. & earlier refs.); Sakai, 1939, pp. 466, 467, 714, text fig. 30 (syn. & refs.); Barnard, 1950, p. 242, text fig. 44g-h (syn. & refs.).

LOCALITY: General Survey – Low Isles; Boulder Tract, area B2 on published key chart (1 male): Low Isles; from underside of conglomerate slab on reef flat (2 females – carapaces of both approximately 19·5 mm wide).

DISTRIBUTION: Ranges widely in Indo-Pacific region, mainly tropical – E. Africa, Mauritius, to Indian seas and southern Japan, Malay Archipel. and Micronesia, W. and N.E. Australia, New Caledonia, and eastwards to Hawaii, Tahiti, and Tuamotu Islands.

Genus *XANTHO* Leach, 1815
Subgenus *LEPTODIUS* A. M. Edwards, 1863
Xantho (Leptodius) danae Odhner

Xantho (*Leptodius*) *nudipes:* Alcock, 1898, pp. 118, 121 (syn. & earlier refs.).
Xantho danae Odhner, 1925, p. 80 (syn. & ref.): Balss, 1935, p. 133, (syn. & full refs.); Buitendijk, 1960, p. 312, text fig. 9a (syn. & refs., discussion).
Leptodius nudipes: Chilton and Bennett, 1929, p. 747 (full refs.); Stephenson, Stephenson, Tandy and Spender, 1931, p. 59; Ward, 1932, p. 244 (syn. & refs.).
[Not *Xantho nudipes* A. M. Edwards, 1867 = *Medaeus nudipes* (A. M. Edwards).]

LOCALITIES: General Survey – Low Isles; the Shingle Rampart; areas RD and R16 on published key chart; 22.iii.1929 (2 males): from Shingle Rampart or Boulder Tract (1 male): Low Isles; principally from marginal regions of the reef system, where boulders and shingle occurred plentifully (2 males, 3 females – largest a male with carapace 21·5 mm wide).

DISTRIBUTION: Ranges in tropical region from E. Indian Ocean to China, and Hawaii in Pacific Ocean, including Australia, New Caledonia and Samoa.

The single (A. M. Edwards) record of the species from "New Zealand" (specimen in Paris Museum labelled "Cook Strait") has now been formally rejected (see Bennett, 1964, p. 14). Chilton (1911, p. 555), while recording the species with some doubt from the Kermadec Islands, north of New Zealand, stated that he had seen no specimens from New Zealand itself.

Xantho (Leptodius) crassimanus A. M. Edwards

Xantho (*Leptodius*) *crassimanus:* Alcock, 1898, pp. 118, 120 (syn. & earlier refs.).
Xantho crassimanus: Odhner, 1925, p. 80; Buitendijk, 1960, p. 318, text figs. 9c-f (refs. & syn.).

LOCALITIES: General Survey – Low Isles; the Shingle Rampart; areas RD and R16 on published key chart; 22.iii.1929 (1 male, 2 females): Low Isles; principally from marginal regions of the reef system, where boulders and shingle occurred plentifully (5 males, 2 females – largest a female with carapace 23·5 mm wide): Snapper Is., near Low Isles; under stones – rocky reef at low tide (1 male, 3 females): Three Isles, N. of Cape Bedford; reef – no specific habitat (1 male, 1 female).

DISTRIBUTION: Ranges in tropical Indo-Pacific region from Indian seas to Hawaii, including Australia and New Caledonia.

Xantho (Leptodius) exaratus (H. M. Edwards)

Xantho (*Leptodius*) *exaratus:* Alcock, p. 118 (syn. & earlier refs.); Sakai, 1939, pp. 464, 714, pl. lviii, fig. 3, pl. xci, fig. 1 (syn. & refs.); Guinot, 1958, p. 92 (syn. & refs.).
Xantho exaratus: Gordon, 1931, p. 543, text figs. 20, 22b (allied species compared).
Xantho hydrophilus: Montgomery, 1931, p. 435 (syn. & refs.).
Leptodius exaratus: Stephenson, Stephenson, Tandy and Spender, 1931, pp. 59, 61; Guinot, 1964, p. 25 (refs.); Buitendijk, 1960, p. 331, text fig. 9k-m (syn. & refs.).
Xantho (=*Leptodius*) *exaratus*, var.: Gordon, 1934, p. 29, text fig. 16 (refs. etc.).
Xantho (*Leptodius*) *hydrophilus:* Barnard, 1950, p. 223, text figs. 41c, 42c-e (syn. & refs.).

LOCALITIES: Low Isles – Concerning this species, the most abundant and most widely distributed of the reef decapod fauna, it is sufficient to state that it was characteristic of the marginal regions where shingle and boulders occurred plentifully. In the course of the General Survey all specimens were collected there with the exception of two batches (total 16) from "stony" bottoms elsewhere on the reef flat. Only a few of the typical habitats are listed here, and will serve to cover the total of 148 specimens of both sexes collected.

The Shingle Rampart; area marked RC on published key chart; 8.iii.1929 and 10.iii.1929 (2 males): area separating Porites Pond from the North-east Moat; 22.iii.1929 (1 female, ovig.): the Inner Rampart; area IR17 on published key chart; 22.iii.1929 (9 males, 5 females): the Boulder Tract (2 males, 1 female): the Tripneustes Spit; 21.iii.1929 (11 males, 1 ovig. female): the Asterina Spit and Boulder Tract; 9.xi.1928 (1 male, 2 females): Three Isles, off Cape Bedford; reef at low tide; 5.v.1929 (4 males, 3 females); May 1929 (2 males, 4 females): Snapper Island, near Low Isles; rocky reef at low tide (1 male, 2 females).

Distribution: A prolific and widely dispersed species in the Indo-Pacific region, mainly tropical – E. Africa, Red Sea, Indian seas, southern Japan, Malay Archipel., W., N. and N.E. Australia, and eastwards to Polynesia and Hawaii.

Status and Synonymy: Stebbing (1908, p. 7) was the first author to apply the name *Xantho hydrophilus* (Herbst, 1790) to specimens of the present species from regions to the east of the Mediterranean Sea. Holthuis (1954, p. 106), following Drach and Forest (1953, p. 4), clearly demonstrates that the specific name *hydrophilus* cannot be applied to a *Xantho* from European waters, as it was based by Herbst on Indo-Pacific material. With others, the present author cannot reconcile Herbst's figure (1790, I, p. xxi, fig. 124) of his *Cancer hydrophilus* with the Indo-Pacific xanthid now widely known as *Xantho exaratus* (H. M. Edwards). In this instance it is considered advisable to follow workers of the standing of Stimpson, Alcock, Gordon and Sakai, and adopt the specific name *exaratus* for the species recorded here. As Drach and Forest (1953) have noted that Herbst's type of *hydrophilus* is no longer extant in the Berlin Museum its correct application may never be established.

Stimpson's posthumously published study of "*Chlorodius exaratus*" (1907, p. 52, pl. vi, figs. 3–4, 6–9) emphasizes the great variation of the species. This is abundantly evident to any field worker who has collected and examined large series of specimens from even single locations. To attempt to describe these variations in detail would, it is believed, be a major task. Stimpson attempted it but caused some unfortunate confusion. He did, however, provide posterity with some useful figures. Later authors appear to have avoided even quoting Stimpson's work, and only sparse mention has since been made of his recorded varietal forms.*

Montgomery (1931) found that some Western Australian specimens bore a likeness to one of Stimpson's varieties. It was left to Barnard as recently as 1950, as far as can be ascertained, to give us the first considered assessment of Stimpson's studies; he infers that the work must be discredited. Barnard comments on Stimpson's claim that some of his varieties have a "supplementary tooth" on the antero-lateral margin, and one must agree with Barnard in his statement that it is "quite probable that several distinct species are confused". A study of Stimpson's figures (1907, pl. vi), however, convinces the present author that numbers 3, 6, 7 and 9 apply correctly to the variable *exaratus*, hundreds of which from many western Pacific localities have been critically studied in the past 35 years. No confusion concerning the distinctness of *sanguineus*, as noted by Stimpson (p. 52), has ever been experienced. All examples readily recognized as *exaratus* very definitely possessed four antero-lateral teeth (excluding the exterior orbital angle), and this clear character throws suspicion on the status of any described species from the Indo-Pacific region correctly referable to *Xantho*. One of these which should receive critical examination is "*Leptodius planus*" (Ward, 1934, p. 14, pl. iii, figs. 6, 6a) from Christmas Island, Indian Ocean, which is admitted by its author to be close to *exaratus*. Type material of this species is stated to have been lodged in the British Museum. In the absence of the type(s) it would be inadvisable to claim synonymy here merely on the evidence of a short description and rather poorly executed figures.

*"Var. *a*, *sanguineus*" was meant to apply to the now well established *X.* (*L.*) *sanguineus* (H. M. Edwards), quoted as a synonym by Stimpson in the original name form of the species – "*Chlorodius sanguineus*". "Var. *b*, *rugosus*" (pl. vi, fig. 4) is also considered to be applicable to the species *sanguineus*. The synonym *Xantho distinguendus* de Haan, quoted by Stimpson, is today established as a separate species in the same name form (Sakai, 1939, p. 461); not to be confused with the *X. distinguendus* of many later authors, which = *Medaeus granulosus* (Haswell).

Genus *EUXANTHUS* Dana, 1851
Euxanthus sculptilis Dana

Euxanthus sculptilis: Alcock, 1898, pp. 110, 111 (syn. & earlier refs.); Guinot-Dumortier, 1960, p. 167, pl. vi, fig. 39, pl. ix, fig. 49 (syn. & full refs.).

Localities: Low Isles; Thalamita Flat (1 male): Low Isles; vicinity of Shingle Rampart at south-eastern quarter of reef (2 males, 3 females; largest a male with carapace 55·5 mm wide).

Distribution: Ranges widely in tropical Indo-Pacific region – Persian Gulf to Indian seas, the Malay Archipel., Santa Cruz Islands, W., N., N.W. and N.E. Australia, New Caledonia, and eastwards through Polynesia.

Genus *CYCLOXANTHOPS* Rathbun, 1897
Cycloxanthops lineatus (A. M. Edwards)

Cycloxanthus lineatus A. M. Edwards, 1873, p. 209, pl. 6, figs. 5-5d: Miers, 1884, p. 212. Alcock, 1898, p. 124 (earlier refs.).
Cycloxanthops lineatus: Sakai, 1939, pp. 454, 455, 713, pl. lv, fig. 2, text fig. 25a-b (syn. & refs.).

Locality: Batt Reef, near Low Isles; from interstices in basal part of a coral growth; 29.x.1928 (1 male; carapace 10·5 mm wide).

Distribution: Warmer waters of Indo-west-Pacific region – Zanzibar and Red Sea to Indian seas and southern Japan, Arafura Sea, N.E. Australia and New Caledonia.

Remarks: The previous record of the species from Australian coastal waters was that of Miers (1884), who expressed some doubt about his identification. His two specimens were smaller than the one originally described by A. M. Edwards, and he noted variation which was suggested to be due to the stage of growth of his material; the larger specimen was a female only 5 mm in length. The present record of a much larger specimen from Batt Reef is considered correctly referable to the species, and establishes its inclusion in the Australian marine fauna. When freshly preserved, the specimen was uniformly creamish in colour except for some rather indefinite dark blotches on the propodal joints of the ambulatory limbs. The absence of any conspicuous linear red markings on the carapace, as shown in both A. M. Edwards's and Sakai's colour figures, could be attributed to a youthful state, a cryptic mode of life during early development, or to normal colour variation. Other minor points of difference from the original figure of the species is the presence of a sparse fringe of hairs on the upper borders of the meral joints of at least the last two pairs of limbs, a few scattered granules on the carpal joints of the chelipeds, and the carinae on the upper borders of the hands are not quite as entire as represented in the original figure. Instead of continuous ridges, they are more in the nature of rows of low, blunt teeth.

Genus *CYMO* de Haan, 1833
Cymo andreossyi (Audouin)

Cymo andreossyi: Alcock, 1898, p. 173 (syn. & earlier refs.): Stephenson, Stephenson, Tandy and Spender, 1931, p. 47; Barnard, 1955, p. 29, text fig. 11 (syn. & refs.); Guinot, 1958, p. 181, text fig. 26a-b (syn. & refs.).

Localities: Low Isles; Madrepore Moat; from branches of dead coral growths (1 male, 2 females): from branches of coral, *Pocillopora;* 8.i.1929 and 18.iv.1929 (2 ovig. females).

Distribution: Ranges widely in warmer Indo-Pacific region – Red Sea, E. Africa and Madagascar, to Indian seas and southern Japan, Micronesia, Malay Archipel., N.E. Australia, and eastwards through Polynesia to the mid-Pacific.

Genus *Phymodius* A. M. Edwards, 1863

Balss (1938, pp. 54, 58) has claimed that *Cyclodius* Dana, 1852, should supersede *Phymodius* A. M. Edwards. Barnard (1950, p. 215) made some reference to this question but did not discard the use of *Phymodius*. He evidently felt that the question should not be ignored, for Sakai had also been non-committal at a much earlier date (1939, p. 509). The present author is in complete agreement with the non-acceptance of *Cyclodius* as a valid genus. It would be very unwise to make the change proposed by Balss on the limited available evidence. Only an examination of Dana's type (apparently that of *C. ornatus*) could determine the question with any degree of certainty, and this valuable specimen is unfortunately lost.

Phymodius ungulatus (H. M. Edwards)

Chlorodius ungulatus H. M. Edwards, 1834, p. 400, pl. 16, figs. 6-8 – type locality "Australasie".
Phymodius ungulatus: Stephenson, Stephenson, Tandy and Spender, 1931, pp. 44, 59; Gordon, 1934, pp. 36-38, text figs. 17b-b1, 18a, 19c (syn. & refs.); Sakai, 1939, pp. 509, 718, pl. xcvii, fig. 4 (syn. & refs.); Barnard, 1950, pp. 215, 216, text fig. 40i-j (syn. & refs.); Forest and Guinot, 1961, p. 110, pl. xi, figs. 1-4, pl. xii, figs. 1-4, pl. xiii, figs. 1-3, pl. xiv, figs. 1-3, text figs. 86a-b (syn., refs. and discussion).

Localities: General Survey – Low Isles; the reef flat, on rocky and *Cymodocea* bottoms; areas F8 and F9 on published key chart; 4.iv.1929 (2 males): the Anchorage Reefs; area A4 on published key chart; 10.iv.1929 (1 male): the Shingle Rampart; area RA on published key chart (1 male): the Thalamita Flat (1 male, 1 female): the Boulder Tract; area B2 on published key chart (1 male): Low Isles; no specific habitat; 20.iii.1929 (1 female): the reef flat generally, mostly in interstices on undersides of conglomerate slabs and boulders (7 males, 14 females): Batt Reef, near Low Isles; Oct., 1928 (1 male, 1 female): Three Isles, N. of Cape Bedford; reef at low tide; 9.v.1929 (1 female, ovig.); 6.v.1929 (1 female, ovig.); May 1929 (1 male).

Distribution: Ranges widely as an inhabitant of shallow waters of coral reefs in Indo-Pacific region – Red Sea and E. Africa to Indian seas, north to waters south of Japan, Micronesia, Malay Archipel., Australia, and Polynesia as far east as Hawaii, Tahiti and Tuamotu Islands.

Remarks: Most of the large series of specimens recorded here were personally collected and observed in the field. A far greater number was examined than the number retained. At the Low Isles locality the species was very common and abundant in quite restricted areas, where marked and tantalising variation was particularly evident. This same perplexing characteristic has been studied and noted in detail by such earlier authors as Gordon (1934), and Forest and Guinot (1961).

Genus **PLATYPODIA** Bell, 1835

***Platypodia* granulosa** (Rüppell)

Lophactaea granulosa: Alcock, 1898, pp. 100, 101 (syn. & earlier refs.).
Platypodia granulosa: Sakai, 1939, pp. 452, 713, pl. lxxxix, fig. 3 (syn. & refs.); Buitendijk, 1941, p. 304, text fig. 1d on p. 297 (syn. & full refs.); Barnard, 1950, p. 208 (syn. & refs.).

Locality: Low Isles; on reef flat, under slabs of conglomerate rock (2 females – largest with carapace 29·5 mm wide).

Distribution: Ranges widely in warmer waters of Indo-Pacific region – E. Africa, Red Sea, Indian seas, Thailand and Palau Islands, the Malay Archipel., Australia, and eastwards to Hawaii, Tahiti and Tuamotu Islands.

Genus *PARAPILUMNUS* de Man, 1895
Parapilumnus pisifer (McLeay)

Pilumnus verrucosipes: Stimpson, 1907, p. 67, pl. viii, fig. 5 (ref.).
Parapilumnus pisifer: Barnard, 1950, p. 269, text figs. 49i-j (syn. & refs.); Monod, 1956, p. 254, figs. 298-301 (syn. & refs.).

LOCALITY: Low Isles; the Madrepore Moat; from interstices in basal stock of a dead coral growth (1 male juvenile, with carapace 4 mm wide).

DISTRIBUTION: The known range of occurrence is wide and unusual – W. Africa (as far N. as Mauritania), S. and S.E. Africa, and N.E. Australia.

REMARKS: The present record constitutes an addition to the known Australian decapod fauna, and admittedly gives an extraordinary extension to the known range of the species. The single small example has, however, been critically compared with Stimpson's description and figure (1907) and no points of difference could be found.

Genus *GLABROPILUMNUS* Balss, 1932
Glabropilumnus dispar (Dana)

Pseudozius dispar: McNeill, 1926, p. 315 (refs.).
Glabropilumnus dispar: Balss, 1933, p. 39 (ref.); Sakai, 1939, pp. 547, 720 (syn. & refs.).

LOCALITIES: Low Isles; the Madrepore Moat, from interstices in the basal stock of a dead coral growth (2 males, 2 females): Batt Reef, near Low Isles; 29.x.1928 (1 male, 2 females).

DISTRIBUTION: The known range is over a restricted area in the warmer waters (mainly tropical) of the northern Indian Ocean (Maldive and Laccadive Archipel.), north to the Ruykyu Islands (S. of Japan), the Malay Archipel., Australia, and New Caledonia.

Genus *HETEROPILUMNUS* de Man, 1895
Heteropilumnus granulimanus Ward
(Plate II, fig. 1)

Heteropilumnus granulimanus Ward, 1933, p. 385, pl. xxii, figs. 3-4.

LOCALITY: Low Isles; reef at low tide; no specific habitat (1 female; carapace 10 mm wide).

DISTRIBUTION: Tropical waters of N.E. Australia – North West Is., Capricorn Group, Queensland (Ward), and Low Isles (present record).

REMARKS: The present example is the second of its kind to be recognized since the species was originally described. It has been critically compared with Ward's male holotype (12 mm wide) in the collection of the Australian Museum. The published diagrammatic figures of the species are poor, and an inadequate aid for purposes of identification. In view of this the author has considered it necessary to submit a critical photographic study of the recorded female (Pl. II, fig. 1). Other than in sex, the specimen differs in no material way from the male holotype.

Genus *PILUMNUS* Leach, 1815

A key to Australian species of this genus is to be found in Rathbun, 1923, p. 108.

Pilumnus vespertilio (Fabricius)

Pilumnus vespertilio: Alcock, 1898, pp. 191, 192 (syn. & earlier refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 44, 50, 53, 54; Sakai, 1939, pp. 531, 532, 719, pl. c, figs. 1-2 (syn. & refs.); Barnard, 1950, pp. 262, 263, text figs. 49a-b (refs.); Edmondson, 1962, p. 291, text fig. 28b (refs.).
Actaea dentata: Edmondson, 1935, p. 29, pl. 1, fig. B, and text figs. 9a-f.

LOCALITIES: Low Isles – This species was one of the few conspicuously common decapods of the reef system. It was widely distributed over the more or less level surfaces of the reef flat, mostly in the open, and was particularly characteristic of the Thalamita Flat. A total of 16 specimens was collected, but it will suffice to give details here of only a typical few, principally those linked with the General Survey.

A glade in the Mangrove Swamp; area IM1 on published key chart; 5.iv.1929 (1 female): the Thalamita Flat (1 male): the Reef Flat; area F9 on published key chart, near the Madrepore Moat (1 male): between the Madrepore Moat and the Mangrove Park; 4.iv.1929 (1 male): Batt Reef, near Low Isles; 29.x.1928 (1 male): Three Isles, near Cape Bedford; reef at low tide; 7.v.1929 (1 female); 6.v.1929 (1 female); May 1929 (2 males, 1 female).

DISTRIBUTION: Ranges widely in warmer region (mainly tropical) of the Indo-Pacific – E. Africa, Madagascar, Red Sea, Indian seas to southern Japan, Malay Archipel., Australia, and generally eastwards as far as Samoa and the Hawaii Islands.

SYNONYMY: It is unfortunate that Edmondson (1935) failed to recognize his *Actaea dentata* (type locality Tonga, but also recorded from Oahu) as perhaps the commonest species of *Pilumnus* (*P. vespertilio*) inhabiting the entire warmer region of the Indo-Pacific, and which had been reported on from Oahu, Hawaiian Islands, by Rathbun as early as 1906 (p. 862). There is absolutely no doubt that the two are identical. Although Edmondson made no reference to *P. vespertilio* in his 1935 paper, he has since (1962) acknowledged it was an Hawaiian species, stating that "It was recorded from Hawaii many years ago, but has not been reported from this locality recently". This latest paper by Edmondson bears the title "Xanthidae of Hawaii", but in it there is a complete omission of any reference to the species he described in 1935 as *Actaea dentata*.

Pilumnus minutus de Haan

Pilumnus hirsutus: Stimpson, 1907, p. 69, pl. ix, fig. 1 (ref.); Rathbun, 1923, pp. 110, 122, pl. xxviii (refs.).
Pilumnus minutus: Sakai, 1939, p. 535, pl. lxiv, fig. 2, pl. c, fig. 9, text figs. 53a-b (syn. & refs.).

LOCALITIES: Stn. XIX, dredge; about ½ mile N. of Eagle Is., off Lookout Point, near Cape Flattery; 10 fms; 10.iii.1929 (1 juvenile male, 1 female): Stn. XIII, dredge; ½ mile W. of Two Isles, near Cape Flattery; 16½ fms; 7.iii.1929 (1 ovig. female, 1 juvenile female): off Low Isles; dredged in 9–12 fms; 16 and 17.x.1928 (4 males, two of them juvenile).

DISTRIBUTION: Japan, Malay Archipel., N.E. Australia.

Pilumnus spinicarpus Grant & McCulloch

Pilumnus spinicarpus Grant and McCulloch, 1906, p. 15, pl. 1, figs. 2-2a (=*P. cursor*, Haswell – not of A. M. Edwards; and *P. cursor* Calman, in part): Rathbun, 1923, pp. 109, 117, 123 (ref.); McNeill, 1926, p. 308 (syn. & refs.); Stephenson, Stephenson, Tandy and Spender, 1931, p. 47.

LOCALITIES: General Survey – Low Isles; the Mangrove Moat; amongst branches of dead coral growths; 6.iv.1929 (1 female): Stn. IX, dredge; Penguin Channel, between Snapper Is. and Cape Kimberley; 12–14 fms; 22.ii.1929 (1 female): Low Isles; Madrepore Moat; amongst branches of dead coral growths (1 male, with carapace 11 mm wide).

DISTRIBUTION: Recognized to date only from the limited range of N. and E. Australia, mainly in tropical waters.

Pilumnus semilanatus Miers

Pilumnus semilanatus Miers, 1884, p. 222, pl. xxii, fig. B: McCulloch, 1913, p. 325, fig. 43 (refs.); Rathbun, 1923, pp. 109, 114, pl. xxiv, figs. 1-2 (refs.).

LOCALITY: Stn. XII, dredge; Penguin Channel, between Snapper Is. and Cape Kimberley; 10–15½ fms; 24.ii.1929 (1 female – carapace 16·8 mm wide).

DISTRIBUTION: Recorded from N.W. Australia, and N.E. Australia as far south as Moreton Bay.

Genus *ACTUMNUS* Dana, 1851

Actumnus pugilator A. M. Edwards

Actumnus pugilator A. M. Edwards, 1873, p. 195, pl. 7, figs. 1, 1a: Rathbun, 1923, p. 126, pl. xxvii, figs. 3-4 (ref.).

LOCALITY: Stn. XIII, dredge; ½ mile west of Two Isles, off Cape Flattery; 16½ fms; 7.iii.1929 (1 ovig. female; carapace 13·5 mm wide).

DISTRIBUTION: Apparently known only from a limited area – Torres Strait, southwards along the Queensland coast, and eastwards to Lifu Is., off New Caledonia.

Actumnus setifer (de Haan)

Pilumnus setifer de Haan, (1833-49), pt. ii, 1835, p. 50, pl. 3, fig. 3: Alcock, 1898, pp. 201, 202 (syn. & refs.).
Actumnus setifer: Hale, 1927, p. 167, fig. 168 (photo); Balss, 1933, p. 38 (syn. & refs.); Sakai, 1939, pp. 526, 528, 719, pl. lxv, fig. 1 (syn. & refs.); Barnard, 1950, p. 271, text fig. 50 (syn. & refs.).

LOCALITIES: Low Isles; reef flat, under boulders – no specific location (3 specimens – 1 juvenile male, 1 juvenile female, and an adult female with carapace 18 mm wide): Batt Reef, near Low Isles; low tide; no specific habitat (1 juvenile female).

DISTRIBUTION: Ranges widely in tropical to temperate waters of the Indo-Pacific – Red Sea and E. Africa, to Indian seas, north to southern Japan, N.W., N.E. and S. Australia, and eastwards to Samoa, Fiji and Tahiti.

Actumunus forficigerus (Stimpson)

Pilumnus forficigerus: Stimpson, 1907, p. 68, pl. viii, figs. 6, 6a (ref.).
Actumnus forficigerus: Sakai, 1939, pp. 526, 527, 528, 719, pl. xcix, fig. 7 and text fig. 51b (syn. & refs.).

LOCALITY: Stn. XXIV, dredge; ¾ mile N.E. of Pasco Reef, near Two Isles, E. of Lookout Point; 16½ fms; 13.iii.1929 (1 juvenile male – carapace 6 mm wide).

DISTRIBUTION: Southern Japan (several localities); N.E. Australia.

REMARKS: Although the present recorded example is small, there is little doubt that it is correctly identified. Stimpson's original figure of the species is poor when compared with that given by Sakai; it shows no pattern of the areas on the dorsum of the carapace.

The present record constitutes an addition to the Australian faunal list.

Genus *ETISUS* H. M. Edwards, 1834

Etisus laevimanus Randall

Etisus laevimanus: Alcock, 1898, pp. 129, 131 (syn. & earlier refs.); McNeill, 1926, p. 310 (refs.); Sakai, 1939, pp. 497, 717, pl. lix, fig. 3, pl. xcv, fig. 3 (refs.); Barnard, 1950, p. 244, text fig. 45c, d, on p. 246 (refs. & syn., with exception of "*Chlorodius espinosus* Borradaile", 1902 – see under *Pilodius espinosus*, this paper p. 73).

LOCALITIES: General Survey – Low Isles; Mangrove Park; 6.iv.1929 and 19.iv.1929 (1 male, 1 female): Low Isles; vicinity of mangroves; 10.xi.1928 (1 male): exposed reef flat; mainly from crevices among boulders along inner edge of Shingle Rampart in south-eastern quarter (7 males; largest with carapace 57 mm wide): Three Isles, off Cape Bedford; reef at low tide; 6.v.1929 (1 female).

DISTRIBUTION: Ranges widely in warmer waters of Indo-Pacific region – E. Africa, Madagascar, Mauritius and Red Sea, to Indian seas and southern Japan, the Malay Archipel., N.E. Australia, New Caledonia, and as far eastwards as Hawaii and Tuamotu Islands.

Etisus electra (Herbst)

Etisodes electra: Alcock, 1898, p. 133 (syn. & earlier refs.); Rathbun, 1906, p. 851, pl. ix, fig. 7 – photo of Type (ref.); McNeill, 1926, p. 310 (refs.).
Etisus (Etisodes) electra: Sakai, 1939, pp. 498, 500, 717, text fig. 40 (syn. & refs.).
Etisus electra: Barnard, 1950, pp. 244, 245, text figs. 45a, b, on p. 246 (syn. & refs.); Guinot, 1964, pp. 49, 59, pl. v, fig. 1, text figs. 21-22, 28, 30 (syn. & refs.).

LOCALITIES: General Survey – Low Isles; reef flat; area F9 on published key chart; 4.iv.1929 (2 females): Reef flat; between areas F8 and F9 on published key chart; 4.iv.1929 (1 female): between Anchorage Reefs and Tripneustes Spit; 11.iv.1929 (1 male): Low Isles; reef flat generally; always sheltering on eroded undersides of conglomerate slabs and boulders resting on sand (8 males, 10 females): Three Isles, off Cape Bedford; reef flat; May 1929 (1 male, 2 females).

DISTRIBUTION: Ranges widely in tropical Indo-Pacific region – E. Africa and Red Sea to Indian seas and China Sea, Micronesia, Malay Archipel., N.E. Australia, and eastwards as far as Hawaii, Tahiti and Tuamotu Islands.

REMARKS: In some of the specimens of the series the black hue of the fingers extends onto the sides of the palm and along nearly the total length of its lower border.

Etisus anaglyptus (H. M. Edwards)

Etisodes anaglyptus: Alcock, 1898, p. 133 (syn. & earlier refs.).
Etisus (Etisodes) anaglyptus: Sakai, 1939, pp. 498, 499, 717, pl. xcvi, fig. 2 (syn. & refs.).
Etisus anaglyptus: Balss, 1935, p. 133 (refs.); Guinot, 1964, p. 57, text figs. 33a-c of pleopod (refs.).

LOCALITY: Low Isles; reef flat; no specific habitat (2 males, 1 female).

DISTRIBUTION: Ranges widely in warmer waters of Indo-Pacific region – Red Sea and Persian Gulf to Indian seas and southern Japan, the Malay Archipel., N.E. Australia, and through Polynesia as far east as Samoa.

Genus *ERIPHIA* Latreille, 1817
Eriphia sebana (Shaw)

Eriphia laevimana: Alcock, 1898, p. 214 (syn. & earlier refs.); Sakai, 1939, pp. 522, 719, pl. xcix, fig. 1 (syn. & refs.); Gillett and McNeill, 1962, p. 121, pl. 121 (photo from life).
Eriphia laevimanus: Barnard, 1950, p. 273 (syn. & refs.).
Eriphia sebana: McNeill and Ward, 1930, p. 381, pl. lix, figs. 1-2 (syn. & refs.); Stephenson, Stephenson, Tandy and Spender, 1931, p. 47; Forest and Guinot, 1961, p. 122, text figs. 111a-b, 112 (syn. & refs.).

LOCALITIES: General Survey – Low Isles; Southern Moat; amongst dead branched *Porites;* 6.iv.1929 (1 juvenile male): Low Isles; reef flat; no specific habitat (1 male, 1 female).

DISTRIBUTION: Ranges widely in warmer waters of Indo-Pacific region – Red Sea, E. Africa and Madagascar, to Indian seas, southern Japan, Micronesia, and the Malay Archipel., N.W. and N. Australia, eastern Australian coast as far south as Newcastle in N.S. Wales (McNeill and Ward, 1930) New Caledonia, and eastwards through Oceania as far as Hawaii, Tahiti and Tuamotu Islands.

Eriphia scabricula Dana

Eriphia scabricula: Alcock, 1898, pp. 214, 216 (syn. & earlier refs.); Sakai, 1939, pp. 522, 523, 719, pl. xcix, fig. 3 (refs.); Barnard, 1950, pp. 273, 275 (refs.).

LOCALITIES: Low Isles; near North-east Moat; under boulder (1 male; carapace 19 mm wide:) Three Isles, off Cape Bedford; no specific habitat; May 1929 (1 male; carapace 15·5 mm wide).

DISTRIBUTION: Ranges widely in warmer waters of Indo Pacific region – Red Sea, E. Africa and Madagascar, to Indian seas, southern Japan and Malay Archipel., E. Australia as far south as northern N.S. Wales, New Caledonia, and eastwards through Oceania as far as Hawaii, Tahiti, and Tuamotu Islands.

The inclusion of N.S. Wales in the distribution of this species is based on a specimen in the Australian Museum collection from near the mouth of the Clarence River.

Although Edmondson (1923, p. 19) records the species from "Australia", his authority for this cannot be traced in literature (compare also *Actaea hirsutissima*); even Boone's comprehensive list of localities (1934, p. 157) does not include any record from the Australian region. It would appear then, that the present records are the first substantiated report of the species from Australian waters.

Genus *LYDIA* Gistel, 1848
Lydia annulipes H. M. Edwards

Ruppellia annulipes?: Dana, 1852, p. 246, 1855, pl. xiv, figs. 4a-c.
Lydia annulipes: Sakai, 1939, pp. 521, 719, pl. lxiv, fig. 3 (syn. & refs.); Stephenson, Endean and Bennett, 1958, pp. 269, 274; Forest and Guinot, 1961, p. 122, text figs. 109a-b, 110 (syn. & refs.).

LOCALITY: Low Isles; "Under-rock Fauna, Beach Rock"; an additional record from the locality subsequent to the British Great Barrier Reef Expd. of 1928-29.

DISTRIBUTION: Ranges widely in Indo-Pacific region, principally tropical – E. Africa, Persian Gulf, Seychelles, Cocos-Keeling, China Sea to southern Japan, Malay Archipel., Micronesia, N.E. Australia, Samoa, Palmyra and Fanning Islands, Hawaii, Fiji, Tahiti, Tuamotu Islands.

The listing of this species by Stephenson and others (1958) was the first published record of its occurrence in Australian coastal waters. The nearest previously recorded locality would appear to be that of Haswell (1882, p. 73). from Woodlark Is., Louisiade Archipel., off S.E. New Guinea.

Genus *MEDAEUS* Dana, 1851
Medaeus granulosus (Haswell)

Xantho macgillivrayi: Miers, 1884, p. 211, pl. xx, fig. c.
Medaeus granulosus: Sakai, 1939, pp. 459, 714, pl. lix, fig. 1, pl. xc, fig. 5 (syn. & refs.); Barnard, 1950, p. 219, text figs. 41a, 42a-b (syn & refs.); Stephenson, Endean and Bennett, 1958, pp. 269, 278, 300.

LOCALITY: Low Isles; two specific habitats, and species recorded as common; an additional record from the locality subsequent to the British Great Barrier Reef Expd. of 1928-29.

DISTRIBUTION: Ranges widely in Indo-west-Pacific region, mainly tropical – E. Africa, Red Sea, Indian seas, and northwards and eastwards as far as southern Japan and N.E. Australia.

Genus *DOMECIA* Eydoux & Souleyet, 1842
Domecia hispida Eydoux & Souleyet

Domecia hispida: Alcock, 1898, p. 230 (syn. & earlier refs.); Forest and Guinot, 1961, p. 126, pl. xviii, fig. 1, text figs. 117-119, 124 (refs.); Guinot, 1964a, p. 269, text figs. 2, 3, 9, 13, 17 (refs.).
Domoecia hispida: Sakai, 1939, pp. 553, 721, pl. c, fig. 4 (refs.).
[Not *D. hispida* var.?, Borradaile, 1902, p. 263, and *D. hispida* Nobili, 1907, p. 404 = *D. glabra* Alcock.]

LOCALITY: Low Isles; Madrepore Moat; from interstices in basal part of dead coral growth (1 male; carapace 6 mm wide).

DISTRIBUTION: Ranges from Aldabra Is., Red Sea and Indian seas to China Sea, Micronesia, Malay Archipel., and N.E. Australia, New Caledonia, and eastwards through Oceania to Hawaii, Tahiti and Tuamotu Islands, and beyond to coastal waters of Caledonia, Mexico, Panama, and the Galapagos Islands.

Guinot (1964 a, p. 270) has listed the specimen recorded here amongst material of the species she examined in the British Museum collection. What should now be recorded is that this was the first published mention of the species from Australian coastal waters.

Genus *TETRALIA* Dana, 1851
Tetralia glaberrima (Herbst)

Tetralia glaberrima: Alcock, 1898, p. 223 (syn. & earlier refs.); Sakai, 1939, pp. 553, 721, pl. c, fig. 8 (syn. & refs.); Barnard, 1950, p. 280, text fig. 52c-d (syn. & refs.); Serène and Dat, 1957, pp. 3, 16 etc., text fig. 4 and part pls. 3 and 4 (syn. & comparative chars.).

LOCALITIES: General Survey – Low Isles; between Anchorage Reefs and Mangrove Park; 10.iv.1929 (1 male): from an Anchorage reef; ex *Madrepora* (1 male, 2 ovig. females): Stn. XXVII, dredge; Papuan Pass, eastern edge of Great Barrier Reef, east of Bloomfield River; 17 fms; 18.iii.1929 (1 female): Low Isles; from branches of submerged *Madrepora* growth on Anchorage Reefs (1 male).

DISTRIBUTION: Ranges widely in Indo-west-Pacific region, predominantly tropical – E. Africa, Red Sea, Indian seas to southern Japan, Micronesia, Malay Archipel., tropical Australia, New Caledonia, and eastwards to Palmyra Is. in central Pacific, Tahiti, and Tuamotu Islands.

Genus *TRAPEZIA* Latreille, 1825
Trapezia cymodoce (Herbst)

Trapezia cymodoce: Alcock, 1898, pp. 218, 219 (syn. & earlier refs.); McNeill, 1926, pp. 299, 314 (syn. & refs.); Stephenson, Stephenson, Tandy and Spender, 1931, p. 47; Sakai, 1939, pp. 551, 721, text fig. 63 (syn. & refs.); Barnard, 1950, p. 276, text figs. 52a-b (syn. & refs.).

Localities: General Survey – Low Isles; from coral, *Pocillopora* (1 male, 5 females; one of the females collected 13.ii.1928): Stn. XXIII, dredge; in lee of Turtle Isles, off Lookout Point; 8 fms; 12.iii.1929 (1 ovig. female): Stn. X, dredge; across Satellite Reef, near Low Isles, working on sides to S.W. and N.E.; 14–17 fms; 22.ii.1929 (1 male, 1 female): Low Isles and nearby Batt Reef; from living and dead coral colonies (8 males, 6 females).

Distribution: Ranges widely in Indo-Pacific in areas where coral reefs occur – E. Africa and Red Sea to Indian seas and southern Japan, Micronesia, Malay Archipel., W., N. and N.E. Australia, and generally eastwards as far as Hawaii and the Marquesas.

Remarks: The species lives permanently associated with the coral *Pocillopora*. It is readily recognized in life by its general reddish orange colour, and a line of red spots crossing the upper half of the carapace. Adult examples have a conspicuous patch of tomentum on the outer palm of the chelipeds.

Trapezia areolata Dana

Trapezia ferruginea, var. *areolata:* Alcock, 1898, pp. 218, 221 (syn. & earlier refs.).
Trapezia reticulata: Stimpson, 1907, p. 73, pl. ix, fig. 5 (syn. & ref.).
Trapezia cymodoce areolata: Sakai, 1939, pp. 551, 552, 721, pl. C, fig. 7 (syn. & refs.).
Trapezia aerolata: Forest and Guinot, 1961, p. 135, text fig. 133 (ref.).

Localities: Low Isles and nearby Batt Reef; from living coral, *Pocillopora* (3 males, 3 females): Yonge Reef, eastern edge of Great Barrier Reef; lat. 14°35′S.; from the coral, *Stylophora;* 7.vi.1929 (1 male) – This particular specimen was one of several in the collection accompanied by an identification label, and received by the author from the British Museum for elaboration. The name it bore was *Trapezia ferruginea*, and it was listed as such by Stephenson, Stephenson, Tandy and Spender (1931, p. 86).

Distribution: Ranges in a limited area of Indo-Pacific where coral reefs are present – W. Indian Ocean to southern Japan, Micronesia, Malay Archipel., N. and N.E. Australia, New Caledonia, and generally eastwards to Samoa, Fiji and Tahiti.

Remarks: The species is well characterized by the presence of a pattern of reticulating lines on the carapace.

Genus *LOPHOZOZYMUS* A. M. Edwards, 1863
Lophozozymus pictor (Fabricius)

Zozymus (*Lophozozymus*) *octodentatus:* Alcock, 1898, p. 106 (syn. & earlier refs.).
Lophozozymus pictor: Rathbun, 1924, p. 15 (syn. & refs.); Ward, 1932, p. 243 (syn. & refs.); Buitendijk, 1960, p. 297, text fig. 7c (syn. & refs.); Gillett and McNeill, 1962, p. 121, pl. 121, fig. 2 (photo).
Lophozozymus octodentatus: Ward, 1928, pl. xxix (photo.).

Locality: Low Isles; the Thalamita Flat; sheltering under a conglomerate boulder (1 small male – carapace 25·5 mm wide): Batt Reef, near Low Isles; under boulder on exposed flat; 29.x.1928 (1 female – carapace 50 mm wide).

Distribution: Ranges widely in tropical Pacific Ocean – Malay Archipel., from Singapore eastwards to N.W. and N.E. Australia, Fiji, Samoa, Tahiti and Tuamotu Islands.

REMARKS: The species was not common on the coral reef flats listed. It is more characteristic of mainland reefs (*fide* Ward 1932) and to these places may be added the coral reef flats of many of the high islands lying close to the tropical N.E. Australian coast. Forest and Guinot (1961, p. 56, text fig. 40) illustrate a first male pleopod of a specimen from Hayman Is., Cumberland Group, Queensland.

Of the two examples recorded here, the smaller had the carapace irregularly blotched with light scarlet-red on a porcelain-white ground, while the same red colouring on the larger formed an irregular network. In still larger examples collected by the author along the tropical Queensland coast, it has been noted that the lines of the red network pattern become broader and the colour brighter. The effect then is of a scarlet-red crab with porcelain-white spots (*vide* photos in Ward, 1928, pl. xxix; Gillett and McNeill, 1962).

Sakai (1939, p. 452) records that Rathbun, who was followed by Ward, included Japan in the distribution of this species, but indicates that he has been unable to verify the claim. The present author is unable to trace the source of Rathbun's claim of a Japanese record.

Genus ***OZIUS*** H. M. Edwards, 1834

Ozius H. M. Edwards, 1834, p. 404 – Type species *O. tuberculosus* H. M. Edwards. Locality, Indian Ocean.
Ruppellioides A. M. Edwards, 1867, p. 279 – Type species *R. convexus* A. M. Edwards. Locality, "Massacre Bay" (now Nelson, Cook Strait), New Zealand; = *O. tuberculosus* H. M. Edwards, as shown below.

Ozius tuberculosus H. M. Edwards

Ozius tuberculosus H. M. Edwards, 1834, p. 405: A. M. Edwards, 1873, p. 238, pl. 11, figs. 2, 2a (refs.); Alcock, 1898, pp. 182, 183 (earlier refs.); Boone, 1934, p. 150, pl. 77 (refs.); Sakai, 1939, pp. 517, 719, pl. xcviii, fig. 1 (refs.).
Ruppellioides convexus A. M. Edwards, 1867, p. 279: Filhol, 1886, pp. 381, 494, pl. xli, fig. 7; Chilton and Bennett, 1929, p. 752 (refs.); Ward, 1941, p. 12.

LOCALITIES: General Survey – Low Isles; Tripneustes Spit; 21.iii.1929 (1 male): the Shingle Rampart; area RA on published key chart (1 female): Low Isles – reef flat at low tide, 1928 (4 females).

DISTRIBUTION: Indo-west-Pacific region – Mauritius, Ceylon, Mergui Archipel., Nicobars, southern Japan, N.E. Australia, New Caledonia and eastwards to Samoa and the Marquesas.

REMARKS: In the juvenile female of the series the carapace is comparatively smooth; it does not exhibit the same rugged appearance as the other specimens, one of them a male of about the same size.

A comparison of Filhol's figure (1885) of A. M. Edward's type of *Ruppellioides convexus* in the Paris Museum with the description and figure given by A. M. Edwards (1873) of H. M. Edwards's *Ozius tuberculosus*, leaves no doubt that these two species are synonymous.

R. convexus was erroneously credited in the Quoy and Gaimard expedition collections with a New Zealand origin. Being obviously a tropical xanthid form, it has not since been seen in the same temperate region. A number of similar confusions appeared in early lists of New Zealand Decapoda, and these have been either commented upon or listed by Hutton (1882, p. 263), Chilton and Bennett (1929), and Bennett (1964, p. 14).

Ward (1941) has previously recorded *O. tuberculosus* under the name *Ruppellioides convexus* from two other N.E. Australian localities, and from Port Moresby, Papua. He notes some minor differences he found between his specimens and the second known species to be described in the genus *Ruppellioides*, *i.e. R. philippinensis* Ward, from the Gulf of Davao, Mindanao, which is approximately in the centre of the accepted known range of occurrence of *O. tuberculosus*. This new species of Ward's, the type material of which is housed in the American Museum of Natural History, should correctly be accommodated in the genus *Ozius*.

Ozius rugulosus Stimpson

Ozius rugulosus: Alcock, 1898, p. 182 (earlier refs.); Stimpson, 1907, p. 60, pl. vii, fig. 6 (ref.); Sakai, 1939, pp. 517-18, 719, pl. xcviii, fig. 5 (refs.).

LOCALITIES: General Survey – Low Isles; the Shingle Rampart; area RA on published key chart (1 female): Low Isles; the Shingle Rampart at S.E. quarter of reef, and the Boulder Tract; hiding under ledges and in crevices (2 males, 4 females, the largest a male with carapace 45 mm wide): Three Isles, off Cape Bedford; reef at low tide; 6.v.1929 (1 female).

DISTRIBUTION: Ranges widely in tropical region of Indo-Pacific – E. Africa and Red Sea, Indian seas to southern Japan, Philippines, N.E. Australia, New Caledonia, and eastwards to Samoa and Tahiti.

Genus *ACTAEA* de Haan, 1833

Actaea hirsutissima (Rüppell)

Actaea hirsutissima: Alcock, 1898, pp. 138, 141 (syn. & earlier refs.); Odhner, 1925, p. 69, pl. 4, fig. 13 (refs. & locs.); Serène and Lang, 1959, p. 293, text fig. 2d (Chars.).
Actaea hirsutimana: Stephenson, Stephenson, Tandy and Spender, 1931, p. 44.

LOCALITIES: General Survey – Low Isles; the reef flat – *Cymodocea* bottom; areas F8 and F9 on published key chart (1 male, 1 female): Isolated Moat Pool; area M7 on published key chart; 20.iii. 1929 (1 male, 1 female): The Mangrove Park; 24.iv.1929 (1 female): Low Isles; no specific reef habitat (7 males, 1 female – largest a male with carapace 31 mm wide): Batt Reef, near Low Isles; low tide; 29.x.1928 (2 males).

DISTRIBUTION: Ranges widely in tropical Indo-Pacific region – E. Africa, Madagascar, Mauritius, Red Sea to Indian seas, Viet-Nam, Caroline and Marshall Islands, Malay Archipel., N.E. Australia and eastwards to Fiji, Hawaii and Tahiti.

REMARKS: Although Edmondson (1923, p. 15) records the species from "north east Australia", his authority for this cannot be traced in literature (compare also *Eriphia scabricula*). The only reference the present author has been able to trace from Australian waters is the lone, later one of Boone (1934, p. 124) from Falcon Is. Reef, Palm Islands, near Townsville, Queensland. This was included in the long enumeration of localities quoted from the authors given in her list of references to the species. Thus the present records constitute the second substantiated occurrence in the Australian area.

At Low Isles the species occurred plentifully both under and in the interstices of conglomerate slabs and boulders. A noticeable feature in young males is for both the outer and inner palm to lack any trace of black pigmentation. With advancing age the outer palm commonly darkens, with the blackish pigment extending around the lower border to spread upwards across the inner palm until all but a conspicuous strip behind the movable finger is darkened.

Actaea areolata Dana

Actaea areolata: Alcock, 1898, pp. 138, 141 (earlier refs.); Odhner, 1925, p. 65, pl. iv, fig. 12 (refs.).
Actaea areolata?: Rathbun, 1924, p. 16 (refs.).

LOCALITY: Low Isles; the Madrepore Moat; from interstices in basal branches of dead coral growth (1 female – carapace 14·5 mm wide).

DISTRIBUTION: Apparently has a limited range in the Indo-Pacific region – Mergui Archipel. to southern Japan, N.W. and N.E. Australia.

Actaea cavipes (Dana)

Actaea fossulata: Alcock, 1898, pp. 139, 148 (syn. & refs.).
Actaea cavipes: Alcock, 1898, pp. 139, 147 (syn. & earlier refs.); Sakai, 1939, pp. 483, 492, 717, pl. xcii, fig. 7 (syn. & full refs.); Barnard, 1950, p. 229 (syn. & full refs.).
Actaea (Glyptoxanthus) cavipes: Serène and Lang, 1959, p. 294, text figs. 2F1-F3 (ref.).
Glyptoxanthus cymbifer Rathbun, 1914, p. 658, pl. I, fig. 6, pl. II, fig. 7.

LOCALITY: Low Isles; under boulder near the Inner Rampart, on S.E. quarter of reef (1 male – carapace 13·5 mm wide).

DISTRIBUTION: Ranges widely in Indo-Pacific region, mainly tropical – E. Africa, Madagascar, Mauritius, to Red Sea and Indian seas, southern Japan, Micronesia, Malay Archipel., W., N.W. and N.E. Australia, New Caledonia, and eastwards to Samoa, Fiji, Tahiti and Tuamotu Islands.

Actaea rueppellii (Krauss)

Actaea rüppellii: Alcock, 1898, pp. 139, 144 (syn. & earlier refs.); Rathbun, 1924, p. 17 (refs.); Sakai, 1939, pp. 482, 491, 717, pl. xciii, fig. 6 (syn. & refs.); Barnard, 1950, pp. 228, 235, text figs. 37d, 43i-j (syn. & refs.).

LOCALITY: Low Isles; reef – no specific habitat (1 female – carapace 17 mm wide).

DISTRIBUTION: Ranges widely in Indo-Pacific, mainly in tropical region – E. Africa, Madagascar, to Indian seas and southern Japan, Micronesia, Malay Archipel., N.W. and N.E. Australia, New Caledonia, and eastwards to Samoa and Fiji Islands.

Actaea tomentosa (H. M. Edwards)

Actaea tomentosa: Alcock, 1898, pp. 138, 140 (syn. & earlier refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 59, 86; Sakai, 1939, pp. 482, 487, 716, pl. xciii, fig. 8 (syn. & refs.); Barnard, 1950, pp. 228, 233, text figs. 43e-f (syn. & refs.); Serène and Lang, 1959, p. 293, text fig. 2e (discussion & comparison).

LOCALITIES: General Survey – Low Isles; Shingle Rampart and Spit of Shingle Rampart; areas marked RD and R16 on published key chart; 22.iii.1929 (1 male, 2 ovig. females): the Boulder Tract; area B2 on published key chart (1 female): the Shingle Rampart; area RC on published key chart; 20.iii.1929 (1 male): no specific habitats (1 male, 1 female): Low Isles; reef flat generally, under conglomerate coral boulders and in interstices of same (3 males, 5 females – largest a female with carapace 24·5 mm wide): Batt Reef, near Low Isles; 29.x.1928 (1 female): Yonge Reef, eastern edge of Great Barrier Reef, in lat. 14°35′S.; 6.vii.1929 (1 female).

DISTRIBUTION: Ranges widely in Indo-Pacific, mainly in tropical region – E. Africa, Madagascar, and Red Sea to Indian seas, southern Japan, Malay Archipel., N., N.E. and E. Australia as far south as Shellharbour, near Wollongong, N.S. Wales (specimen in Australian Museum), and eastwards to Hawaiian Islands.

REMARKS: This species is the most common representative of *Actaea* on the coral reefs of the Great Barrier Reef. Whitley and Boardman (1929, p. 370) give general notes, with a photograph of the crab's characteristic habit of remaining motionless upon being disturbed or handled. These observations were made at Low Isles during the Expedition's field work.

Actaea polyacantha (Heller)

Actaea polyacantha: Rathbun, 1911, p. 222, pl. 18, figs. 5-6 (syn. & refs.); Odhner, 1925, p. 57 (syn. & refs.); Stephenson, Stephenson, Tandy and Spender, 1931, p. 47; Ward, 1932, p. 247 (syn. & refs.); Sakai, 1939, pp. 482, 486, 716, pl. xciv, fig. 3 (syn. & refs.); Guinot, 1958, p. 87, text fig. 14a-b (syn. & refs.).

LOCALITY: Low Isles; reef at low tide; from basal part of coral growth, *Pocillopora* (1 male).

DISTRIBUTION: Indo-west-Pacific region; from Red Sea and E. Africa to China Sea, southern Japan, Marshall Islands, New Britain, N.W. and N.E. Australia, Gilbert Islands, Fiji, and Samoa.

This comparatively small species is recognized for the second time from Queensland waters.

Genus ***ATERGATIS*** de Haan, 1833

Atergatis floridus (Linnaeus)

Atergatis floridus: Alcock, 1898, pp. 95, 98 (syn. & earlier refs.); Sakai, 1939, pp. 447, 713, pl. lviii, fig. 1 (syn. & refs.); Barnard, 1950, p. 207, text fig. 38c-d (syn. & refs.); Buitendijk, 1960, p. 268 (syn. & refs.); Gillett and McNeill, 1962, p. 121, pl. 121, fig. 1 (photo).
Atergatis ocyroe: Stephenson, Stephenson, Tandy and Spender, 1931, pp. 44, 47, 54, 59; Balss, 1935, p. 139 (refs.).

LOCALITIES: General Survey – Low Isles; the reef flat; area F9 on published key chart; 4.iv.1929 (1 male): the Shingle Rampart; area RC on published key chart; 20.iii.1929 (1 male): area separating Porites Pond from North-east Moat; 22.iii.1929 (1 male): the Mangrove Park; 17.iv.1929 (1 female): the reef flat, on rocky and *Cymodocea* bottoms; areas F8 and F9 on published key chart; 4.iv.1929 (2 males, 2 females): the Boulder Tract; area B2 on published key chart (1 male): no specific habitat; 10.iii.1929 (1 female): Low Isles; the reef flat generally (6 males, 7 females, the largest a male with carapace 48 mm wide): Batt Reef, near Low Isles; 13.ix.1928 (1 female, with carapace 34 mm wide): Three Isles, N. of Cape Bedford; reef at low tide; 9.v.1929 (1 male).

DISTRIBUTION: Ranges widely in warmer waters of Indo-Pacific region, particularly in coral reef areas – E. Africa, Red Sea, to Indian seas and southern Japan, Malay Archipel., Australia, and eastwards as far as Hawaii, Tahiti and Tuamotu Islands. On the E. Australian coast examples have been recorded from as far south as Port Jackson, N.S. Wales (see McNeill and Ward, 1930, p. 382).

REMARKS: This species was one of the most widespread and commonest crabs of the Low Isles reef system. It was plentiful on the Thalamita Flat and other areas where eroded conglomerate boulders occurred, especially on silty or muddy sand, and was often observed moving sluggishly around in the open in shallow stretches of water left by the tide.

Genus ***PILODIUS*** Dana, 1851
(=***CHLORODOPSIS*** A. M. Edwards, 1873)

Pilodius has been shown by Forest and Guinot (1961, p. 89) to have priority over *Chlorodopsis*. A detailed key separating the species of this genus is given by Serène and Luom (1959) under the name *Chlorodopsis*. This key does not, however, include the species *Pilodius espinosus* (Borradaile) recognized and recorded below.

Pilodius nigrocrinitus Stimpson

Chlorodopsis melanochira: Alcock, 1898, pp. 166, 168 (earlier refs.).
Chlorodopsis nigrocrinita: Alcock, 1898, pp. 166, 168 (ref.); Sakai, 1939, pp. 502, 504, 717, pl. lxii, fig. 2, pl. xcvii, fig. 2 (syn. & refs.); Serène and Luom, 1959, pp. 304, 337, pl. I, fig. C, text figs. 2B, 5B (syn. & refs.).
Chlorodopsis melanochirus: Stephenson, Stephenson, Tandy and Spender, 1931, p. 59.

LOCALITIES: General Survey – Low Isles; the Shingle Rampart; areas RA, RC, RD and R16 on published key chart; 8, 20 and 22.iii.1929 (6 males, 2 females): the reef flat; area F9 on published key chart; 4.iv.1929 (1 female): the Asterina Spit; 9.xi.1928 (1 male): the Boulder Tract; area B2 on published key chart (1 male, 1 female): Batt Reef, near Low Isles; low tide; Oct. 1928 (3 males): Three Isles, N. of Cape Bedford; 5, 6 and 8.v.1929 (6 males, 2 females).

The total of specimens from Low Isles was 20 males and 16 females (largest a male 14·5 mm wide between antero-lateral margins). Practically all came from areas close to the edge of the reef system, as the above selected list of habitats indicates.

DISTRIBUTION: A typical inhabitant of coral reefs, with apparently a limited range in the Indo-Pacific region – Bay of Bengal to Viet-Nam and southern Japan, the Malay Archipel., N.E. Australia New Caledonia and eastwards to Kermadec and Fiji Islands.

REMARKS: The species was found to be common and widespread, hiding in interstices and crevices on the undersides of conglomerate slabs and boulders. It was noted that only the males had the black of the immovable finger extending extensively on to the lower palm, a feature most noticeable in older examples. When freshly preserved in alcohol, the carapaces of the majority of the specimens carried a rust-coloured pattern on a more or less creamish ground colour.

Pilodius espinosus (Borradaile)
(Plate I; figs. 2–5)

Chlorodopsis espinosus Borradaile, 1902, p. 262, text fig. 57.

LOCALITIES: Stn. XIV, dredge; ½ mile S.E. of Lizard Is., off Lookout Point; 19 fms; 7.iii.1929 (2 females, with carapaces 10·5 and 14 mm wide): Stn. XVII, dredge; about ¼ mile N. of N. Direction Is., off Lookout Point; 19 fms; 9.iii.1929 (7 males, 9 females, with carapaces 5·5 to 17 mm wide).

DISTRIBUTION: Previously known only from the type locality – Funadu Velu, Miladumadulu Atoll, Maldive Archipel., Indian Ocean.

REMARKS: Borradaile's largest specimen of this species was only 12 mm wide, and those of comparable size in the present series agree very well with the line figure he has given. Some minor differences are to be seen in specimens larger than the one illustrated by Borradaile, but these can be accepted as due to variation with growth. Concerning this variation, the most reliable comparison would be one with Borradaile's type material in the Cambridge University Museum, where the present extensive series of the species is also to be deposited.

Dr. L. B. Holthuis has kindly drawn the author's attention to the fact that Odhner (1925, p. 83) and Balss (1938, p. 58) have stated that *C. espinosus* is based on juvenile specimens of *Etisus laevimanus* Randall, 1839, but the advent of the present rather abundant new material of *C. espinosus* has provided the opportunity for a critical check of this claim, and has convinced the author that it is wrong.

The present record of the species constitutes a new addition to the Australian marine faunal list.

Pilodius spinipes Heller

Chlorodopsis wood-masoni Alcock, 1898, pp. 166, 170; Wood-Mason and others, 1899, pl. xxxvii, fig. 7; Bouvier, 1915, p. 280, fig. 32 (ref.).
Chlorodopsis spinipes: Serène and Luom, 1959, pp. 320-324, 338, pl. II, figs. A, B, pl. III, figs. G, H, text figs. 2G, H, 3B 4B, 5E (syn., refs. discussion).
Pilodius spinipes: Guinot, 1964, p. 68 (refs.).
[Not "*Chlorodopsis spinipes*" of other authors as noted by Serène and Luom (1959, p. 319), where they refer a large number of incorrect records of Heller's species to the synonymy of "*Chlorodopsis*" *pugil* (Dana, 1852).]

Locality: General Survey – Low Isles; The Boulder Tract; area B2 on published key chart (2 females – one of them ovig.)

Distribution: Mauritius, Red Sea, Somalia, and Andamans (Indian Ocean), Viet-Nam, Marshall Islands, N.E. Australia (Pacific Ocean).

Remarks: Little doubt is attached to the present identification. The specimens recorded greatly extend the range of the species, and also constitute an addition to the Australian decapod fauna.

Genus *CHLORODIELLA* Rathbun, 1897

Chlorodiella nigra (Forskål)

Chlorodiella niger: Alcock, 1898, p. 160 (syn. & earlier refs.); McNeill and Ward, 1930, p. 383 (refs.); Barnard, 1950, p. 213 (syn. & full refs.).
Chlorodiella nigra: Sakai, 1939, pp. 508, 718, pl. xcvii, fig. 1 (syn. & full refs.); Forest and Guinot, 1961, pp. 95, 102, text figs. 87-89, 97a-b (refs., key to genus).

Localities: General Survey, Low Isles; the Inner Rampart; 20.iii.1929 (1 male): Stn. XIV, dredge; ½ mile S.E. of Lizard Is., off Lookout Point; 19 fms; 7.iii.1929 (1 male, with antero-lateral spines more acute than is normal for the species): Low Isles; under conglomerate slabs and boulders on the Thalamita Flat, and elsewhere over the reef flat, and also from nearby Batt Reef (8 males, 3 females): Three Isles, N. of Cape Bedford; reef at low tide; 6.v.1929 (1 female).

Distribution: Very widely distributed in warmer regions of the Indo-Pacific, particularly among coral reefs – E. Africa, Red Sea, Indian seas and southern Japan, and as far eastwards as Hawaii and Tahiti; including Australia, where the species penetrates to the temperate waters as far south as Shellharbour, near Wollongong, N.S. Wales (see McNeill and Ward, 1930).

Genus *CARPILODES* Dana, 1851

Though only one of the four species of the genus listed here has been previously recorded from Australian waters, some ten other named species have been recorded in literature from Australia (for the majority of these see Odhner, 1925). A key to the known species of *Carpilodes* is given by Serène and Luom (1960, p. 175).

Carpilodes margaritatus A. M. Edwards

Carpilodes margaritatus: Odhner, 1925, p. 24, pl. 2, fig. 4; pl. 5, fig. 8 (syn. & refs.); Sakai, 1939, pp. 472, 476, 715, text fig. 36 (syn. & refs.); Buitendijk, 1960, p. 261, text fig. 3b (ref.); Serène and Luom, 1960, pp. 178, 185, pl. ii, fig. D, text fig. 2F.

Locality: Low Isles; the Madrepore Moat; from interstices in basal branches of dead coral growths (3 males, 2 females – largest a female with carapace 18·5 mm wide; smallest a male 6·5 mm wide).

DISTRIBUTION: Ranges widely in warmer regions of Indo-Pacific – Madagascar to Red Sea and Persian Gulf, India, southern Japan, Malay Archipel., New Guinea, N.E. Australia, New Caledonia, and eastwards to Samoa.

REMARKS: All of the specimens agree perfectly with the published figures of the species, and possess particularly an ochre-coloured pattern over a carapace of light plum hue which agrees with that shown in de Man's figure of his synonymous *C. striatus* (1887a, p. 232, pl. viii, fig. 1), and commented on by Buitendijk (1960).

The body proportions of the smallest specimen (a male) closely resemble those of the Type of Targioni-Tozzetti's "*Chlorodius exiguus*", as figured by Odhner (1925, pl. 5, fig. 8); it is about the same size and clearly shows the proportions of width and length of carapace to be less marked than in larger specimens. The species is recognized here for the first time from Australian waters.

Carpilodes caelatus Odhner

Carpilodes sp. Calman, 1900, p. 4.
Carpilodes caelatus Odhner, 1925, p. 21, pl. 1, fig. 19 (ref.): Sakai, 1939, pp. 471, 475, 715 (ref.); Guinot, 1958, p. 86 (refs.); Serène and Luom, 1960, p. 177, text fig. 2A (chars. in key and ♂ pleopod – spelling "*coelatus*" used throughout).

LOCALITY: Stn. XXV, dredge; Papuan Pass, eastern edge of Great Barrier Reef, east of Bloomfield River; 20–25 fms; 17.iii.1929 (1 female, ovig.; carapace 5·5 mm wide).

DISTRIBUTION: Recorded to date from Mayotte Isle near Madagascar, Cocos-Keeling Atoll, China Sea, Bonin, Marshall, Sulu, Amboina and Kei Islands, Torres Strait, and N.E. Australia.

Few records of the species are to be found in literature. The advent of the present example extends its range in Australian seas considerably southwards from Torres Strait. The specimen is a small one, but is obviously mature, and agrees perfectly with the illustration given by Odhner.

Carpilodes laevis A. M. Edwards

Carpilodes laevis: Odhner, 1925, p. 13, pl. I, figs. 2-3 (ref.); Sakai, 1939, pp. 471, 473, 715, text fig. 35 (refs.); Serène and Luom, 1960, pp. 176, 181, pl. I, fig. D, text fig. 1D (chars. in key & ♂ pleopod – spelling "*loevis*" used throughout).

LOCALITY: Low Isles; Madrepore Moat; from interstices in basal branches of dead coral growth (1 male, 1 female; carapaces 9 mm and 11 mm wide respectively): Three Isles, off Cape Bedford; May, 1929 (1 male; carapace 12 mm wide).

DISTRIBUTION: Ranges from Philippine Islands to China Sea, New Guinea, N.E. Australia, New Caledonia, and Fiji.

The present record appears to be the first from Australian coastal waters.

Carpilodes pallidus Borradaile

Carpilodes pallidus Borradaile, 1900, p. 586, pl. xl, fig. 3: Edmondson, 1923, p. 12 (ref.); Odhner, 1925, p. 20, pl. I, fig. 17 (syn. & refs.).

LOCALITY: Madrepore Moat; from interstices at base of dead coral growth; Oct., 1928 (2 males, 2 females – largest a male with carapace 10·5 mm wide).

DISTRIBUTION: Ranges from northern Indian Ocean eastwards to Malay Archipel. and Micronesia, N.E. Australia, thence to central and south tropical Pacific Ocean as far as Palmyra and Fanning Islands, and Tahiti. The species has not previously been recognized from Australian waters.

Genus *EPIXANTHUS* Heller, 1861
Epixanthus frontalis (H. M. Edwards)

Epixanthus frontalis: Alcock, 1898, pp. 184, 185 (syn. & earlier refs.); Grant and McCulloch, 1906, p. 13 (syn. & refs.); Rathbun in Stimpson, 1907, p. 60, pl. vii, fig. 4 (ref.); Sakai, 1939, pp. 518, 519, 719, pl. xcviii, fig. 4, text fig. 47 (syn. & refs.); Barnard, 1950, p. 259, text fig. 48a-b (syn. & refs.); Guinot, 1958, p. 276, text figs. 29a-b and 31 (syn. & refs.).

Localities: Low Isles; the Shingle Rampart; no specific area (1 male, 2 females – male specimen the largest, with carapace 24 mm wide): the Shingle Rampart; in vicinity of North-east Moat (1 major cheliped – hand, including immovable finger, 50·5 mm long; obtained from a large specimen too well ensconced in interstices of the shingle to extricate whole): Three Isles, near Cape Bedford; reef at low tide; 5.v.1929 (1 female); 6.v.1929 (2 males, 2 females).

Distribution: Ranges widely in Indo-Pacific region, mainly tropical – E. Africa, Red Sea, Persian Gulf to Indian seas and southern Japan, Malay Archipel., Micronesia, N.W. and N.E. Australia, and New Caledonia. Records from Sydney in N.S. Wales (Ortmann, 1893) and Tasmania (Whitelegge, 1897, p. 136, under syn. of *Pseudozius caystrus*) are considered by the author to be erroneus.

Remarks: In this species it is normal for the inner angle of the carpus of the chelipeds of average sized specimens to be obtuse, and not developed into a strong spine as is the inner angle of the carpus of the large cheliped recorded here from Low Isles.

Genus *HETEROPANOPE* Stimpson, 1858
Heteropanope changensis (Rathbun)

Actumnus changensis Rathbun, 1910a, p. 357, text fig. 41 (ref.).
Heteropanope changensis: Balss, 1933, p. 33 (syn. & refs.).

Localities: Low Isles; outer margin of Thalamita Flat, and in proximity of Inner Rampart; from undersides of conglomerate boulders; Aug. to Nov., 1928 (1 male, 2 females – carapaces 7 to 7·5 mm wide): Three Isles, N. of Cape Bedford; beach rock of actual cay islet; 7.v.1929 (1 male, 2 females – one ovig.).

Distribution: Gulf of Siam (Thailand), Indonesia, N.E. Australia.

The species has, apparently, been recorded from only four localities, and is recognized here from Australian waters for the first time.

Remarks: The largest of the male examples from Low Isles was submitted to the late Mary J. Rathbun, United States National Museum, Washington for comparison with her type material of the species. She replied by letter in the following terms – "I have compared your *Actumnus changensis* with our cotypes and think that the identification is correct. Your specimen [lacking minor cheliped] is larger than any of the type lot, and the differences noted are doubtless due to age. The last two lateral teeth of the carapace resemble little sharp spines in the cotypes, but are more dentiform in the old; also the distal groove on the carpus of the major cheliped is much more marked in the old. Otherwise they agree."

Family **PINNOTHERIDAE**
Genus *XANTHASIA* White, 1846
Xanthasia murigera White

Xanthasia murigera: Alcock, 1900, p. 341 (refs.); Grant and McCulloch, 1906, p. 23 (ref., record only); Barnard, 1950, p. 81 (refs.).

LOCALITY: Low Isles; commensal in mantle of the clam, *Tridacna squamosa*, found embedded in a conglomerate boulder on reef flat; 19.v.1929 (1 male, with carapace 9 mm wide; 1 female, 12 mm wide).

DISTRIBUTION: Associated with coral reefs in Indo-Pacific region – E. Africa to Bay of Bengal, the Philippines, and as far eastwards as New Caledonia and Fiji, including N.E. Australia.

REMARKS: The female recorded here has the brood pouch filled with well developed eggs, each containing a conspicuous zoeal larva. Other specimens in the Australian Museum collection have been taken from *Tridacna* sp. (St. Crispin's Reef, off Port Douglas, and Hayman Is., Cumberland Group); *Tridacna maxima*, published as *T. elongata* (Masthead Is., Capricorn Group – *q.v.* Grant and McCulloch, 1905; and *Hippopus hippopus* (Crescent Reef, near Lizard Is., north of Cooktown) – all in Great Barrier Reef, Queensland waters.

Family **GRAPSIDAE**

Genus ***PERCNON*** Gistel, 1848

Percnon planissimum (Herbst)

Liolophus planissimus: Alcock, 1900, p. 439 (syn. & earlier refs.).

Percnon planissimum: Hale, 1929, p. 70, pl. v (syn. & refs.); Balss, 1935, p. 144 (refs.); Sakai, 1939, pp. 703, 732, pl. lxxix, fig. 4 (syn. & refs.); Barnard, 1950, p. 138, text fig. 26i-j (refs.); Edmondson, 1959, p. 197, fig. 25c (photo), and text fig. 27 (syn. & refs.); Crosnier, 1965, p. 90, text figs. 135, 138, 144, 150, 151 (refs.).

LOCALITY: Yonge Reef, Great Barrier Reef, in lat. 14°35′S.; reef crest, under boulders; 6.v.1929 (1 male). When this specimen was received from the British Museum by the author for elaboration, it was found to bear a label identifying it as "*Percnon abbreviatus*", and was listed as this species by Stephenson and others (1931, p. 86).

DISTRIBUTION: Indo-Pacific region generally; ranges widely from E. Africa, Madagascar and Red Sea to Indian seas and southern Japanese seas, Malay Archipel., and eastwards through Oceania to Hawaii, Tahiti, Tuamotu Islands. In Australia recorded from W., N.E., and E. Australian coast south to Port Jackson, N.S. Wales (specimens in Australian Museum collection).

REMARKS: Edmondson's work (1959) clearly defines the differences separating this species from *P. abbreviatum* (Dana). A close examination of extensive material in the collection of the Australian Museum, Sydney, indicates that the form *P. planissimum* is the only one found occurring along the Australian coast.

Genus ***GRAPSUS*** Lamarck, 1801

Grapsus albolineatus Lamarck

Grapsus strigosus: Alcock, 1900, p. 393 (syn. & earlier refs.); Tesch, 1918, p. 71, pl. iv, figs. 1, 4 (ref.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 37, 82; Sakai, 1939, pp. 649, 650, 729, pl. cvi, fig. 3 (syn. & refs.); Gillett and McNeill, 1962, p. 121, pl. 121, fig. 3 (photo).

Grapsus albolineatus: Banerjee, 1960, p. 147, text figs. 1c, 2 o-p, 3a-f (full syn., refs.).

LOCALITIES: Low Isles; without specific habitat (2 females): Three Isles, north of Cape Bedford; 7.v.1929 (1 male, 1 female). The largest of the four specimens collected is a female measuring 43 mm across the carapace.

DISTRIBUTION: Ranges widely in Indo-Pacific region, mainly tropical – E. Africa and Red Sea, Indian seas to southern Japan, Malay Archipel., N.W., N.E. and eastern tropical Australia, then eastwards through Polynesia to Hawaiian Islands.

REMARKS: In a lengthy discussion Banerjee (1960) has shown that the old and long used name of *Grapsus strigosus* (de Haan) must now be sunk into the synonymy of *G. albolineatus*. This author's findings are supported by the acknowledged help and approval of Dr. L. B. Holthuis.

On the question of distribution, Banerjee has unfortunately misquoted Balss (1935, p. 141), which he cites, by doubting that the species occurs in Australian waters. Balss actually records it from two Western Australian localities, and merely expresses the opinion that the species was probably rare in Australian waters. As a matter of fact, it can be stated with confidence here that *G. albolineatus* is common and widespread along a great length of the Australian coast, particularly in the area of coral-crowded waters of the north-eastern part. The illustration in Gillett and McNeill (1962, pl. 121, fig. 3) is of a female example collected at Heron Is., a small coral cay of the Capricorn Group in southern Great Barrier Reef waters. A specimen in the Australian Museum from Lady Elliot Is., an isolated coral cay east of Bundaberg, Queensland, appears to represent the southernmost record for the occurrence of the species.

Genus ***PLANES*** Leach (in Bowdich), 1825
Planes cyaneus Dana

Planes cyaneus: Chace, 1951, p. 88 etc., text figs. 1b, 2b, e, h, m-o, 3i-n etc. (full syn. & refs.); Crosnier, 1965, p. 30, text fig. 35 (syn. & refs.).

Locality: Low Isles; found clinging to portion of a floating coconut shell and husk deposited at low tide on the reef (1 male).

Distribution: Widely dispersed in warmer waters of the Indo-Pacific, clinging to turtles, floating seaweed and other inanimate objects.

Prior to the publication of Chace's wide study of this species, it was generally accepted that all Pacific Ocean records were referable to *P. minutus* A. M. Edwards. Recorded from Western Australia as *P. minutus* by Montgomery (1931, p. 456) and from eastern Australia as far south as coast near Port Jackson, N.S. Wales by McNeill (1921, p. 57, photo). The occurrence of *Planes cyaneus* in New Zealand waters has recently been confirmed by Dell (1963, p. 179 and 1693a, p. 52 and fig.).

Genus ***PACHYGRAPSUS*** Randall, 1839
Pachygrapsus minutus A. M. Edwards

Pachygrapsus minutus A. M. Edwards, 1873, p. 292, pl. xiv, fig. 2: Gordon, 1934, pp. 7, 8 (syn. & refs.); Balss, 1934, p. 229 (syn. & ref.); Tweedie, 1936, p. 46 (syn. & refs.); Sakai, 1939, pp. 655, 656, 730, text fig. 112a-c (syn. & refs.); Crosnier, 1965, p. 26, text figs. 23, 29, 30 (refs.).
Pachygrapsus murrayi: Ward, 1934, p. 25 (ref.).

Localities: General Survey – Low Isles; the Boulder Tract; area B2 on published key chart (1 female): Low Isles; under boulder on the Thalamita Flat (1 female, with carapace 5·5 mm wide).

Distribution: Ranges widely in warmer region of the Indo-Pacific, from E. Africa and Madagascar, to Christmas Is. (Indian Ocean), southern Japan, Philippines, N.E. Australia, and eastwards to New Caledonia, Hawaii, Tahiti, Clipperton and other nearby eastern Pacific islands.

The species is recognized here for the first time from Australian waters.

Genus ***SARMATIUM*** Dana, 1851
Sarmatium crassum Dana

Sarmatium crassum: Alcock, 1900, p. 426 (earlier refs.); Tesch, 1917, pp. 215, 231, 258 (syn. & refs.); Barnard, 1955, p. 28, text fig. 9 (syn. & refs.); Crosnier, 1965, p. 74, pl. v, fig. 1, text figs. 121-124 (refs.).

Locality: General Survey – Low Isles; the Earthworm Spit, in the Mangrove Swamp; area IM5 on published key chart; 6.iv.1929 (1 male).

DISTRIBUTION: Recorded over a wide tropical Indo-Pacific range, from E. Africa and Madagascar to Nicobars and S. China, the Malay Archipel., N.E. Australia and Samoa.

The present specimen appears to be the first to be recognized from Australian waters.

Genus *SESARMA* Say, 1817
Subgenus *SESARMA* (s.s.)
Sesarma (Sesarma) edwardsii brevipes de Man

Sesarma (*Sesarma*) *edwardsii*, var. *brevipes* de Man, 1902, p. 509 (syn. & refs.).
Sesarma (*Sesarma*) *edwardsii brevipes:* Tesch, 1917, p. 147 (syn. & refs.).

LOCALITY: Daintree River, north of Port Douglas, Queensland; 18.xi.1928 (1 male, carapace 13 mm wide).

DISTRIBUTION: Ternate, Batjan, Halmaheira (de Man); Sydney in New South Wales, Flores, Philippines, Atjeh (Tesch); N.E. Australia (present record).

REMARKS: Mr. B. Campbell (Queensland Museum), who is currently making a study of the local Sesarminae, has kindly identified this species for the author. He states that he has "only ever seen these crabs well upstream, in almost fresh water". Campbell's reference to the habitat of the species casts considerable doubt on the "Sydney" record. The present author has considerable knowledge of the local Sydney decapod fauna, and knows of only one totally different species of the Sesarminae occurring in far upper river reaches of this district.

The identity of this latter species, originally taken by the *Challenger* Expedition in the upper reaches of the Hawkesbury River, immediately north of Sydney and Port Jackson is (at the time of writing) still in doubt. Miers (1886, p. 271) recorded it as "*Sesarma schütti* Hess", and Miers's identification was later referred to the synonymy of *Sesarma* (*S.*) *gracilipes* H. M. Edwards by Tesch (1917, p. 154). Gordon (1937, p. 155) subsequently recognized Miers's specimen as distinct from *S. gracilipes* and now believes (*pers. com.*) that it is most probably an undescribed form. Additional material has now been provided from the Hawkesbury River area and is receiving critical examination by Dr. I. Gordon and Mr. R. W. Ingle of the British Museum (Nat. Hist.).

Subgenus *HOLOMETOPUS* H. M. Edwards, 1853
Sesarma (Holometopus) villosum (A. M. Edwards)

Sesarma (*S.*) *villosa:* de Man, 1895, p. 153; 1898, p. 698, pl. 29, figs. 30a-e.
Sesarma (*H.*) *villosa:* Tesch, 1917, p. 208, pl. xvii, fig. 2 (syn. & full refs.).
Sesarma (*H.*) *villosum:* Crosnier, 1965, p. 55, text figs. 75, 76, 77a, 78 (syn. & refs.).
Sesarma villosa: Stephenson, Stephenson, Tandy and Spender, 1931, pp. 42, 61.

LOCALITIES: General Survey – Low Isles; the Inner Rampart; 20.iii.1929 (1 male): the Mangrove Swamp; in area indicated by symbols IM4 and IM5 on published key chart; 5.iv.1929 (1 juv. female): Low Isles; without specific habitat but certainly from the Mangrove Swamp area (1 juv. male): Low Isles; an additional record from this locality subsequent to the British Great Barrier Reef Expd. of 1928-29 is given in Stephenson, Endean and Bennett, 1958, p. 269.

DISTRIBUTION: Ranges widely in Indian Ocean and south-west Pacific region, but records are few – Madagascar, Atjeh in Sumatra, Philippines, Carolines, New Guinea, N.E. Australia and Samoa.

REMARKS: Tesch (1917) draws attention to the superficial resemblance of this and other related species of *Sesarma* to the genus *Clistocoeloma*. It should be noted that the recording of the species by T. A. Stephenson and others (1931) constituted an addition to the Australian decapod fauna.

Subgenus *CHIROMANTES* Gistel, 1848
Sesarma (Chiromantes) bidens (de Haan)

Sesarma bidens: Alcock, 1900, pp. 411, 415 (syn. & earlier refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 42, 61.
Sesarma (Chiromantes) bidens: Tesch, 1917, p. 132 (full syn. & refs.); Sakai, 1939, pp. 680, 688, 731, pl. lxxix, fig. 1 (syn. & refs.).

LOCALITIES: General Survey – Low Isles; the Earthworm Spit near mud, in Mangrove Swamp; area IM5 on published key chart (2 specimens; immature): Low Isles; no specific habitat but one obviously in the Mangrove Swamp area; 10.iii.1929 (2 males).

DISTRIBUTION: Ranges widely in tropical Indo-Pacific region – Madagascar, Zanzibar to Indian seas, China, southern Japan, the Malay Archipel., N. and N.E. Australia, then eastwards to Fiji.

REMARKS: Through a misinterpretation of Miers's remarks (1884, p. 246) Whitelegge (1889, p. 229) erroneously listed this small species from Port Jackson, N.S. Wales; it definitely does not range so far south into temperate E. Australian waters. The present record verifies the occurrence (published by Miers with some hesitation) of this species in eastern Australia. In the Australian Museum collection there is additional material of the species from a number of localities along the Queensland coast as far south as Gladstone Harbour.

Since the foregoing was written, Campbell (1967) has reviewed the Australian species of *Sesarma*, subgenus *Chiromantes*. He regards previous Australian records of *S. bidens*, including that of Stephenson *et al.* (1931:42,61) from Low Isles, as almost certainly referable to one of his new species, *S.* (*C.*) *messa*. The latter is recorded from estuaries and sheltered bays in mangrove thickets from Moreton Bay north to Cairns, and probably to Thursday Island at the tip of Cape York.

Genus *METOPOGRAPSUS* H. M. Edwards, 1853
Metopograpsus frontalis Miers

Metopograpsus messor frontalis Miers, 1880, p. 311.
Metopograpsus messor gracilipes de Man, 1891, p. 49, pl. 4, fig. 14: 1895, p. 75 (ref.).
Metopograpsus messor: Stephenson, Stephenson, Tandy and Spender, 1931, pp. 42, 59, 61. [Not *M. messor* (Forskål).]
Metopograpsus gracilipes: Tweedie, 1949, p. 470, text fig. 1g (syn. & refs.).
Metopograpsus frontalis: Banerjee, 1960, pp. 174, 182, text figs. 5e, 6b-e (syn., refs., chars. in key); Forest and Guinot, 1961, p. 157 (syn., ref., status).

LOCALITIES: General Survey – Low Isles; glades inside the Mangrove Swamp; in areas marked IM4 and IM5 on published key chart; 5.iv.1929 (2 males, 1 female): the Mangrove Park; 17.iv.1929 (1 ovig. female): Shingle Rampart; area marked RC on chart; 8-20.iii.1929 (1 male, 2 females – one ovig.): Shingle Rampart and Spit of same; areas defined as RD and R16; 22.iii.1929 (1 male): the Inner Rampart; area IR17; 22.iii.1929 (1 female): Shingle Rampart; area RA (1 ovig. female): the Earthworm Spit; area marked IM5 (2 males, 2 females): General Survey; no specific habitat; 10-20. iii.1929 (2 males): Low Isles; no specific habitat (2 males, 2 females – largest a female with carapace 19·5 mm wide): Three Isles; N. of Cape Bedford; reef at low tide; 6.v.1929 (1 female); Three Isles (3rd Island); 7.v.1929 (2 females).

DISTRIBUTION: Apparently ranges widely in the warmer seas of the south-west Pacific region, from southern Japan to N.E. Australia and eastwards thereof. Extension of range westwards into Indian Ocean has not yet been determined.

REMARKS: A very common inhabitant of the Mangrove Swamp area at Low Isles, usually in semi-dry parts, sheltering under logs and fallen tree limbs; large examples were not conspicuous.

The species has long been regarded as a synonym of *M. messor* (Forskål), to which it bears a super-

ficial likeness, but the form of the first male pleopods has now been shown to be markedly different. Other distinguishing features recorded are the more slender propodites of the walking legs of *M. frontalis*, and a difference in the colour of the chelae of the two species; the latter are pale in *M. frontalis* and deep chestnut brown in *M. messor* (see Banerjee, 1960).

Family **PALICIDAE**
Genus ***CROSSOTONOTUS*** A. M. Edwards, 1873
Crossotonotus compressipes A. M. Edwards

Crossotonotus compressipes A. M. Edwards, 1873, p. 283, pl. xiii, figs. 1a-f: 1874a, p. 83; Ward, 1933, p. 389.
Crossonotus compressipes: Haswell, 1882, p. 96 (refs.).

Locality: Low Isles; reef flat at low tide – no specific habitat noted (1 female).

Distribution: Known from New Britain, Torres Strait, N.E. Australia, New Caledonia, and Samoa.

Remarks: The present specimen has been critically compared with A. M. Edwards's description and figures. Being a female, it has less sturdy limbs than the figured male, particularly the posterior pair. Also, the four frontal lobes are not quite as clearly defined as shown in the same figure, and the front as a whole appears to protrude a little more. The inner sides of the markedly more slender hands are naked except for a few longish hairs midway along each of the fingers of the larger one. The upper borders of the propodites of the first three pairs of legs carry small serrations, and as many as three and four tiny teeth are present on the lower edges of the dactyli of the legs. Regarding the latter character, A. M. Edwards's description states there are only two teeth present, but these are not shown in his figure of the species.

A male of the species from Hope Is., N. Queensland, is in the collection of the Australian Museum (Reg. No. P.3740); it is approximately the same size as the Low Isles female, but lacks chelae. The specimen has the frontal lobes more distinctly defined, the single limb present of the last pair is sturdier and more in accord with A. M. Edwards's figure, and the dactyli (lower edges) are armed with only one or two teeth. In the lesser characters there is definite variation between the sexes.

Genus ***PALICUS*** Philippi, 1838
Palicus oahuensis Rathbun
(Plate II, figs. 5–6)

Palicus oahuensis Rathbun, 1906, p. 836, pl. vii, fig. 4, text fig. 2: Balss, 1922, p. 120, text fig. 6 (ref.).
Cymopolia oahuensis: Sakai, 1939, pp. 608, 609, text fig. 90a (refs.); Edmondson, 1962a, p. 9 (syn. & refs.).

Locality: Stn. XV, Agassiz trawl; ½ mile outside Cook's Passage, Great Barrier Reef, E. of Lookout Point; drifting N.; 210 fms; 8.iii.1929 (1 female, carapace 13 mm wide).

Distribution: The present known occurrence is – southern Japanese waters, N.E. Australia and Hawaii.

Remarks: The specimen could be said to have the median frontal lobes a little more prominent than in the female holotype described and figured by Rathbun (carapace 10·3 mm), but this is considered to be due to the slightly larger size.

As far as is known, the present record is only the fourth published recognition of the species, and constitutes an addition to the Australian marine fauna.

Palicus whitei (Miers)

Cymopolia whitei Miers, 1884, p. 551, pl. xlix, fig. c.
Palicus whitei: Calman, 1900, p. 31, pl. 2, figs. 14-19 (syn. & refs.); Rathbun, 1911, p. 240, pl. 19, fig. 10 (refs.).

Localities: Stn. XVI, dredge; about ½ mile W. of N. Direction Is., off Lookout Point; 20 fms, stony; 9.iii.1929 (1 male, 1 female): Stn. XVII, dredge; about ¼ mile N. of N. Direction Is.; 19 fms, sand, thick *Halimeda* weed; 9.iii.1929 (3 females, including the largest example collected – carapace 22 mm wide).

Distribution: The limited known tropical Indo-west-Pacific range of the species includes the Seychelle and Andaman Islands, Torres Strait, and N.E. Australia.

Remarks: Recorded only once before from the Australian region (Calman, 1900); the present recorded material represents the second known recognition of the species, and the first from Australian coastal waters. Miers (1884) remarks on its superficial similarity to *P. jukesii* (White), the third species of *Palicus* now known from the Australian region. The latter was originally described from Sir C. Hardy's Is., between Capes Direction and Grenville, Cape York, Queensland, and is known from material in the Australian Museum with other Queensland localities of Holbourne Is., Port Denison (dredged); and Hayman Is., Cumberland Group (5 fms).

Family **OCYPODIDAE**
Genus ***UCA*** Leach, 1814
Uca triangularis (A. M. Edwards)

Gelasimus triangularis: de Man, 1887-1888, p. 119, pl. viii, figs. 8-11 (syn. & refs.); Alcock, 1900, pp. 352, 356 (syn. & refs.); Tweedie, 1937, p. 144, fig. 1c (refs.).
"*Gelasimus annulipes*": Stephenson, T. A. & others, 1931, p. 42.

Locality: General Survey – Low Isles; margin of the Earthworm Spit, in the Mangrove Swamp, near mud; in area IM5 on published key chart; 6.iv.1929 (5 juvenile specimens).

Distribution: Mergui Archipel., west coast Malay Peninsula, N.E. Australia and New Caledonia.

Remarks: When received from the British Museum by the author for examination, these specimens were accompanied by an identification label reading "*Gelasimus annulipes*". They were listed under the same name by Stephenson, Stephenson, Tandy and Spender, 1931, p. 42.

The examples of this species are immature, the largest measuring only 8 mm between the tips of the antero-lateral spines. Nevertheless, the identification fits well Alcock's key and description, with the largest of several detached major chelae having all the characters well defined.

There is no previous record of the occurrence of the species on the Australian coast, and this second published recognition from a far eastern quarter of the range supports de Man's belief that the species would ultimately be found to occur throughout the intervening Malay Archipelago.

Uca tetragonon (Herbst)

Gelasimus variatus Hess, 1865, p. 146, pl. vi, fig. 7: Haswell, 1882, p. 94 (ref.); McNeill, 1920, p. 105 (ref.).
Gelasimus tetragonon: de Man, 1887b, p. 698 (syn. & ref.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 53, 61.
Gelasimus tetragonum: Alcock, 1900, pp. 353, 357 (syn. & refs.).
Uca tetragonon: Crosnier, 1965, p. 112, text figs. 187, 197-200 (syn. & refs.).

Localities: General Survey – Low Isles; Inner Rampart (2 males, one of them coll. 21.v.1929): reef flat, near Madrepore Moat (3 females).

Distribution: E. Africa, Madagascar, Red Sea and other scattered localities in tropical Indo-Pacific region as far east as Hawaiian Islands.

Remarks: The author (McNeill, 1920) has refused to accept Hess's "Sydney", New South Wales record for his *G. variatus*; the species definitely has never been collected in temperate parts so far to the south. In fact, it is doubtful if *U. tetragonon* has, before this, been recorded from true Australian coastal waters. The nearest occurrence appears to be a record by Calman (1900, p. 24) from Torres Strait, off N.E. Australia.

Uca dussumieri (H. M. Edwards)

Gelasimus dussumieri: de Man, 1887-1888, p. 108, pl. vii, figs. 2-7 (refs.); Alcock, 1900, pp. 353, 361 (syn. & refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 41, 42; Tweedie, 1937, p. 141, fig. 2b (syn. & refs.).
Uca dussumieri: Balss, 1935, p. 141 (refs.); Crosnier, 1965, p. 112 (syn. & refs.).

Locality: General Survey – Low Isles; Earthworm Spit, in area IM4B on published key chart (5 males, 2 females – three of them coll. 6.iv.1929).

Distribution: Tropical Indo-Pacific region, from Madagascar to Indian seas and China coast, the Malay Archipel., W., N.W., N. and N.E. Australia, and New Caledonia.

Genus ***MICTYRIS*** Latreille, 1806

Mictyris longicarpus Latreille

Mictyris longicarpus: McNeill, 1926a, p. 102, pl. ix, and text fig. 1 (syn. & full refs.); Sakai, 1939, pp. 645, 729, pl. lxxiii fig. 5 (syn. & refs.); Stephenson, Endean and Bennett, 1958, p. 269 (record only).

Locality: N. side of Cape Bedford, near Cooktown; silty-sand tidal flat; May 1929 (2 males). Low Isles – an additional record from the locality subsequent to the British Great Barrier Reef Expd. of 1928-29.

Distribution: Ranges extensively in western Pacific and eastern Indian Ocean from the southern temperate region, through the tropics to the northern temperate region – E., N. and W. Australia, Bay of Bengal, Malay Archipel., and northwards to southern Japan.

Remarks: The earliest record of this species from Low Isles (actual headquarters of the Expedition) is that of Macgillivray (1852, p. 34), who used the name "*Mycteris subverrucata*". This author noted that "legions . . . traverse the dry sands at low water". The name *M. subverrucata* is a *nomen nudum*, published by White (1847, p. 102) and is in fact a synonym of the temperate Australian *Mictyris platycheles* H. M. Edwards (*fide* Miers, 1884, p. 248; McNeill, 1926a, p. 127).

Genus ***MACROPHTHALMUS*** Latreille, 1829

Macrophthalmus convexus Stimpson

Macrophthalmus convexus: Tesch, 1915, pp. 154, 175, pl. vii, fig. 8 (syn. & refs.); Kemp, 1919, p. 389, pl. xxiv, fig. 2 (refs.); Sakai, 1939, pp. 623, 625, 727, text fig. 97 (syn. & refs.); Edmondson, 1962a, p. 21, figs. 9a-c, 10a (syn. & refs.).
Macrophthalmus graeffei: Laurie, 1915, p. 470, fig. 5 (ref.).

Locality: Low Isles; from burrow in sand near S.E. end of the Mangrove Swamp; 7.ix.1928 (1 juvenile female, measuring 9 mm between the external orbital angles).

Distribution: Eastern Indian Ocean to Pacific Ocean, mainly tropical – Gulf of Manaar, Andamans, Mergui Archipel., to southern Japan, Micronesia, the Malay Archipel., N.E. Australia, New Caledonia, and eastwards to Hawaii and Tahiti.

Remarks: Although small, the single example of this species fits well the characters as given by Tesch. It was apparently uncommon at the locality, but could be expected to occur at various points amongst the coral reef fauna of the Queensland coast.

The only previous locality for the Australian region mentioned in literature is the general one, "Australia" (Miers, 1880, p. 307). Haswell (1882, p. 89), Tesch (1915) and other authors have merely repeated Miers's original record.

Macrophthalmus telescopicus (Owen)

Macrophthalmus telescopicus: Tesch, 1915, pp. 152, 161, pl. v, fig. 2 (syn. & refs.); Stephenson, Stephenson, Tandy and Spender, 1931, p. 56; Sakai, 1939, pp. 623, 727, pl. lxxiii, fig. 1. (syn. & refs.).

Localities: General Survey – Low Isles; the Sand Flat; 20.iv.1929 (1 ovig. female): Low Isles; dug out of the Sand Flat (1 young female and 1 juvenile, measuring respectively 16 mm and 9 mm across the carapace).

Distribution: Widespread in Indo-Pacific region, mainly tropical – Red Sea to southern Japan, Malay Archipel., N.E. Australia, and eastwards to Hawaii.

Remarks: Previous records of this species or its synonym *M. podophthalmus* from the Australian region are Torres Strait (Miers, 1886), Thursday Is. (Ortmann, 1894), and Holbourne Is., Port Denison, Queensland (Haswell, 1882).

The species appeared to be scarce at the Low Isles locality. Although undoubtedly correctly identified, the three young specimens had eyestalks which projected for only about $\frac{1}{3}$ of their length beyond the external orbital angles.

Macrophthalmus quadratus A. M. Edwards
(Plate II, figs. 2–4)

Macrophthalmus quadratus A. M. Edwards, 1873, p. 280, pl. 12, fig. 6: Tesch, 1915, pp. 155, 185, pl. viii, fig. 10 (ref.); Stephenson, Endean and Bennett, 1958, pp. 269, 281.
[Not *Macrophthalmus quadratus* of Boone, 1934, p. 204, pls. 107-109.]

Localities: General Survey – Low Isles; Extension of Inner Rampart, in area marked IR17 on published key chart; 22.iii.1929 (1 female): in area separating Porites Pond from the North-east Moat; 22.iii.1929 (1 female): Low Isles; occupying shallow burrows in the Sand Flat, at low tide; Oct., 1928 (4 males and 6 females – an exceptionally large female of the series measured 11 mm between the external orbital angles): Three Isles, N. of Cape Bedford; reef at low tide; 8.v.1929 (1 female, ovig.).

Distribution: New Caledonia and N.E. Australia.

Remarks: The present examples are undoubtedly referable to the above species, listed by Tesch as rare. They were recognized by the author for the first time since originally described when a collection of Decapoda from Low Isles was named for W. Stephenson before the publication of the most recent ecological survey of the area (Stephenson, Endean and Bennett, 1958). In this work the species was listed with other members of the fauna, but no mention was made of the fact that it had not previously been recorded from Australian waters. Boone's identification of this species is in error as her figures clearly show a narrow-fronted *Macrophthalmus* with convex antero-lateral margins and heavily hirsute limbs, all features contrary to those figured for Milne Edwards's species. No attempt is made here to identify Boone's material from New Caledonia and her record of *M. quadratus* is not considered further.

The species is not uncommon at a number of island localities along the tropical Queensland coast. Identified specimens are in the Australian Museum from Hayman Is. and Brampton Is., Cumberland Group, between Mackay and Bowen; all collected by the author.

Critical examination of all available specimens has shown the postero-lateral borders of the carapace to be only slightly convergent, and not nearly so marked as represented in Tesch's rather poor figure.

The general colour in life is creamish, the carapace marked with an irregular chequered pattern, dark grey to greenish in colour, which merges into a darker area immediately behind the front; legs with mottling of light grey. The patterning provides a most effective camouflage for this small species against the sandy background of its habitat, making it hard to detect specimens, even from a short distance.

Genus *OCYPODE* Fabricius, 1798

A comprehensive and detailed account of the Western Australian species of this genus is given by George and Knott (1965, pp. 15–21, figs. 1–2). All Australian species, with the exception of *O. urvillei* Guérin, are discussed and differentiated in a key. No specific references are given below to the above review other than in the problematic case of *Ocypode kuhlii* de Haan.

Ocypode cordimana Desmarest

Ocypoda cordimana: Alcock, 1900, pp. 345, 349 (refs.); Sakai, 1939, pp. 612, 613, 726, pl. civ, fig. 1 (refs.).
Ocypode cordimana: Stimpson, 1907, p. 110, pl. xv, fig. 2 (refs.).
Ocypode cordimanus: Barnard, 1950, p. 84, fig. 17a-b (full refs.); Crosnier, 1965, p. 96, pl. viii, fig. 3, text figs. 154, 162, 171-172 (refs.).

Locality: Low Isles, on beach of sand cay (2 females; one of them collected 14.ii.1929).

Distribution: Ranges widely from tropical to temperate regions of Indo-Pacific – E. Africa and Madagascar to Red Sea and southern Japan, Malay Archipel., Australia, and as far eastwards as Hawaii and Tahiti.

In Australia the species is known from the north-western and north-eastern coasts, and the eastern coast at least as far south as Botany Bay, N.S. Wales (specimens in Australian Museum).

Ocypode ceratophthalma (Pallas)

Ocypoda ceratophthalma: Alcock, 1900, p. 345 (syn. & earlier refs.); Whitley and Boardman, 1929, p. 370, illustr. of burrow; Sakai, 1939, pp. 613-15, 727, pl. civ, fig. 5, and text fig. 91a (syn. & refs.).
Ocypode ceratophthalmus: Barnard, 1950, pp. 84-86, text fig. 17c-d (syn. & refs.); Crosnier, 1965, p. 93, pl. viii, fig. 1, pl. x, fig. 3, text figs. 152, 160, 167-168 (refs.).

Localities: Low Isles; beach of sand cay; coll. at night (2 males, 2 females; the largest a male with carapace 31·5 mm wide): Cape Bedford, near Cooktown, Queensland mainland; on beach, May 1929 (1 male, carapace 42·5 mm wide).

Distribution: A widespread and common species in warmer regions of the Indo-Pacific – E. coast of Africa, Madagascar and Red Sea to Indian seas and southern Japan, Malay Archipel., Australia, and eastwards to Tahiti, Hawaii and Clipperton Is.

Remarks: In Australia the species is known from the western, north-western and north-eastern coasts, and the eastern coast at least as far south as Shell-harbour, near Wollongong, N.S. Wales (specimens in Australian Museum).

Notes on the habits of this species and a photograph of a typical beach burrow at Low Isles are given by Whitley and Boardman (1929, p. 370) in a general article on their activities with the British Great Barrier Reef Expedition in 1928.

Ocypode cf. *kuhlii* de Haan

Ocypode (*Ocypode*) *kuhlii* de Haan (1833-1850), part ii, 1835, p. 58.
Ocypode kuhlii: de Man, 1881, p. 250 (ref.); Barnard, 1950, p. 87, text figs. 17e-g (syn. & refs.); George and Knott, 1965, p. 18 (status); Crosnier, 1965, p. 101, pl. ix, fig. 1, text figs. 157, 164, 176-177 (syn. & refs.).
Ocypoda kuhlii: Sakai, 1939, pp. 613, 614, 727 (refs.); Stephenson, Endean and Bennett, 1958, pp. 269, 273.

LOCALITY: Low Isles; beach (1 specimen); a probable additional record from the locality subsequent to the British Great Barrier Reef Expd. of 1928-29.

DISTRIBUTION: Recorded from widely scattered localities (some not as yet verified) in Indo-Pacific region, principally tropical – E. Africa, ? southern Japan, Java, New Guinea, ? N.E. Australia, ? New Hebrides, ? Hawaii.

REMARKS: De Haan's original description of *O. kuhlii* from the type locality of Java was short and inadequate, and not accompanied by a figure. Much later de Man (1881) published a far more lengthy description of the two specimens in the Leyden Museum, repository of de Haan's type material, but still no figure was provided. It was not until the recent appearance of Crosnier's study (1965) of the species that its status was fully established. A scrutiny of the paper by George and Knott published in the same year (1965) will disclose the confusion that existed concerning records of the occurrence of *O. kuhlii*, and the actual identity of specimens on which these records were based. The figures of *O. kuhlii*, together with a description of de Haan's type material, that have now finally been provided by Crosnier (including illustrations of the male pleopod of a specimen from New Guinea), leave no doubt as to the authenticity of the species.

The single specimen on which the present record of *O. kuhlii* was originally based by W. Stephenson and others (1958) was examined by the present author who, at the time, was convinced that the identification was correct. The characters noted failed to agree with those of the closest ally of the species, *O. ceratophthalma* (Pallas), known to occur at the same locality. Upon seeking a later check examination, it was learnt that the specimen in question was no longer available, having been mislaid in the Department of Zoology, University of Queensland.

While W. Stephenson and others (1958) state that the species was "previously unrecorded in Queensland", it is considered wise, in all the circumstances, not to accept the occurrence as constituting a new record for Australian coastal waters until verified at some later date.

Genus ***EUPLAX*** H. M. Edwards, 1852

Euplax tridentata (A. M. Edwards)

Cleistostoma tridentatum: de Man, 1896, pp. 93-95, pl. iii, figs. 5, 5a, 5b (not fig. 4). Generic placing doubted by de Man, who considered it to be closer to *Chaenostoma*.
Metaplax hirsutimana Grant and McCulloch, 1906, p. 21, pl. 1, figs. 3, 3a, 3b.
Euplax tridentata: McCulloch, 1913, p. 321 (syn., full refs., & Rathbun's comments); Stephenson, Stephenson, Tandy and Spender, 1931, p. 42.

LOCALITY: General Survey – Low Isles; edge of Earthworm Spit, near mud; 6.iv.1929; area IM5 on published key chart (12 specimens; both sexes).

DISTRIBUTION: The range appears to be confined to the E. Australian coast, from tropical north Queensland, south to Port Jackson, N.S. Wales.

This small species has been recorded infrequently in literature, and the present record is only the second one from the coast of Queensland, N.E. Australia. The large series on which Grant and McCulloch (1906) based their description and figures was collected in Port Curtis, Queensland.

Since the above was written, Barnes (1966) has reviewed the status of the genus *Euplax* and has placed "*E. tridentatus*" in a new genus, *Australoplax*. That is the E. Australian species should now be known as *Australoplax tridentata* (A. M. Edwards).

Group **HAPALOCARCINIDEA** (*Incertae Sedis*)

See Fize and Serène, 1957, pp. 7–9 (Affinities).

Family **HAPALOCARCINIDAE**

Genus ***CRYPTOCHIRUS*** Heller, 1861

Cryptochirus coralliodytes Heller

Cryptochirus coralliodytes: Grant and McCulloch, 1906, p. 33 (refs.); Edmondson, 1933, p. 14, pl. 4A, B and text fig. 5 (refs.); Barnard, 1955, p. 25 (syn. & refs.); Fize and Serène, 1957, pp. 5, 13, 31, 169, numerous figs., some in colour, and photographs of animal and burrow mouth (syn. & refs.).
Cryptochirus sp. Stephenson, Stephenson, Tandy and Spender, 1931, p. 74, in part.

Localities: General Survey – Low Isles; reef; from clear cut, circular-mouthed burrows in the living coral *Favia*; 6.ii.1929 (2 males, 4 ovig. females): same habitat; 14.iii.1929 (2 ovig. females).

Distribution: Ranges widely in tropical Indo-Pacific region – Red Sea and S.E. Africa, and generally eastwards to Indian seas, Viet-Nam, N.E. Australia and as far as Hawaii.

Serène (1962, p. 30) discusses the material identified by Edmondson (1933) as this species from central Pacific islands. Much of this material is redetermined to conform with Fize and Serène's (1957) generic classification, and *C. coralliodytes* is positively recorded from Raratonga, Cook Islands.

Genus ***TROGLOCARCINUS*** Verrill, 1908

Subgenus ***MUSSICOLA*** Fize & Serène, 1957

The type of the genus *Troglocarcinus* is the West Indian *T. corallicola* Verrill, 1908. This species was placed by Fize and Serène (1957, pp. 55, 110) together with two Indo-Pacific species in a new subgenus, *Mussicola*. However, the subgenus which contains *T. corallicola* must bear the name *Troglocarcinus*. This means that *Mussicola* is a synonym of the nominate subgenus *Troglocarcinus* Verrill. The situation has been further confused as Fize and Serène (1957, pp. 55, 56) have incorrectly used the name *Troglocarcinus* for a completely different subgenus containing only Indo-Pacific species. Therefore *Troglocarcinus* Fize and Serène, 1957, is a homonym, and not a synonym, of the subgenus *Troglocarcinus* Verrill, 1908. Thus another subgeneric name is needed for the latter grouping in Fize and Serène's system.

In view of the confusion outlined above it is not proposed to introduce here any rearrangement of existing subgeneric names. Thus the name *Mussicola* is used below in the sense of Fize and Serène (1957), but without prejudice to future correction.

Troglocarcinus (Mussicola) heimi Fize & Serène

Cryptochirus sp. Stephenson, Stephenson, Tandy and Spender, 1931, p. 74, in part.
Troglocarcinus heimi Fize and Serène, 1955a, p. 378, fig. 24.
Troglocarcinus (*Mussicola*) *heimi:* Fize and Serène, 1957, pp. 5, 110, 111, 170, numerous figs., some in colour, and photographs of animal and characteristic irregularly oval-mouthed burrows (syn. & refs.).

Localities: General Survey – Low Isles; reef; from burrows in the living coral *Symphyllia*; 15.x.1928 (2 males, 2 ovig. females – of the males, 1 mature, 1 late megalopa): same habitat; 26.i.1929 (7 ovig. females): same habitat; 24.ii.1929 (4 ovig. females): same habitat (2 ovig. females).

Distribution: Viet-Nam (Fize and Serène), N.E. Australia (present record). Apparently this species is recognized here for the first time outside the area of its type locality.

Remarks: Using the key characters given by Fize and Serène for the separation of the three species recognized in this subgenus, the present series of both sexes is identified as *Troglocarcinus* (*M.*) *heimi*. Every specimen, however, bears markedly stronger and more obvious spines around lateral, posterior and median edges of the deep antero-dorsal concavities of the carapace, than those figured

by Fize and Serène (1957, fig. 29) for this species. Strong additional spines are present along the sharp median crest separating the antero-dorsal concavities, and also at the dorso-distal extremity of the merus of the first walking leg. Despite these differences, the author considers the identification is sound, and in keeping with the present limited knowledge of the expected extent of geographical variation in the aberrant hapalocarcinids.

The habitat of this species in Vietnamese waters is given as the two mussid coral genera *Lobophyllia* and *Symphyllia*. At Low Isles, all specimens were taken from what is assumed, following Stephenson and Wells (1956:43), to be *Symphyllia nobilis* (Dana), the only common member of the genus recorded from the study area (Crossland, 1952:144, pl. XI, figs. 2 and 3, and other Great Barrier Reef Exped. reports use the synonym *S. recta*). *Troglocarcinus heimi* has already been recorded from *S. nobilis* by Fize and Serène.

Order **STOMATOPODA**
Family **SQUILLIDAE**
Genus ***PSEUDOSQUILLA*** Dana, 1852
Pseudosquilla ciliata (Fabricius)

Pseudosquilla ciliata: Kemp, 1913, pp. 96, 196 (syn. & full refs.); Stephenson and McNeill, 1955, pp. 245, 256, 258, 261 (syn. & refs.).

Localities: Stn. XII, dredge; Penguin Channel, between Snapper Is. and Cape Kimberley; 10–15½ fms; 24.ii.1929 (1 specimen): Stn. XIV, dredge; ½ mile S.E. of Lizard Is., off Lookout Point; 19 fms; 7.iii.1929 (1 specimen): Stn. XVII, dredge; about ¼ mile N. of N. Direction Is., near Lizard Is., off Lookout Point; 19 fms; 9.iii.1929 (2 specimens): Low Isles; dredged or trawled (Agassiz) in adjacent waters (5 specimens – largest approximately 66 mm long from tip of rostrum to ends of movable spines on telson).

Distribution: Ranges widely in the warmer waters of the Indian, Pacific and Atlantic Oceans, and of constant occurrence in the fauna of coral reefs. In Australia the species is known only from Torres Strait south to Moreton Bay, north and eastern Queensland.

Colour note: The species may be uniform in hue or else mottled and carrying three pairs of prominent dark spots on the abdominal terga.

Genus ***LYSIOSQUILLA*** Dana, 1852
Lysiosquilla maculata (Fabricius)

Lysiosquilla maculata: Kemp, 1913, pp. 110-116, pl. viii, figs. 86-93 (syn. & earlier refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 56, 74; Stephenson and McNeill, 1955, pp. 246, 256, 258, 261, 262 (syn. & full refs.).
Lysiosquilla miersi de Vis, 1883, p. 321; Kemp, 1913, pp. 111, 116 (refs.).

Locality: General Survey – Low Isles; from burrow in reef flat; area F7 on published key chart; 10.iv.1929 (1 distal toothed portion of raptorial limb).

Distribution: Ranges widely in tropical and temperate Indo-Pacific region – from S. Africa to southern Japan, N.W., N.E., and E. Australia as far south as Port Jackson, N.S. Wales; and Oceania.

Remarks: Although not common, numbers of specimens were observed in the mouths of their burrows at low tide on the reef flat. Many efforts to cut off the creatures' retreat by driving down a metal spade were frustrated by the obstruction of the breccia-clogged detritus sand.

A detailed account of the character and structure of the burrows of *L. maculata*, as observed at Low Isles during the Expedition, is given by Mary Popham (1939) in her description of the commensal lamellibranch *Phlyctaenachlamys* found therein.

Genus *GONODACTYLUS* Berthold, 1827

Since this report was written, a paper by Raymond B. Manning, U.S. National Museum, on Australian Stomatopoda has appeared (Manning, 1966). In this work, Manning provides a key to the Australian species of *Gonodactylus* s.s. Additional localities are given for the two species discussed here, and the contentious varieties *platysoma* and *smithii* of *G. chiragra* are treated as full species. Under both these names he lists, without locality details, Great Barrier Reef Expedition material now held in the British Museum.

Gonodactylus chiragra (Fabricius)

Gonodactylus chiragra: Kemp, 1913, pp. 155-162, pl. ix, fig. 107, and text fig. 2 (syn. & earlier refs.); Stephenson, Stephenson, Tandy and Spender, 1931, pp. 44, 59, 74; Stephenson and McNeill, 1955, pp. 250, 257, 258, 261 (syn. & refs.).
Gonodactylus chiragra var. *platysoma:* Kemp, 1913, p. 162, text fig. 1 (syn. & refs.).

Localities: General Survey – Low Isles; Tripneustes Spit; 21.iii.1929 (1 specimen): Shingle Rampart; area RA on published key chart (1 specimen): Stn. XXIV, dredge; ¾ mile N.E. of Pasco Reef, near Two Isles, E. of Lookout Point; 16½ fms; 13.iii.1929 (1 juvenile specimen): Low Isles; reef flat generally; no specific habitats (20 specimens; entire body length of largest 88 mm): Snapper Is., near Low Isles; rocky reef at low tide (1 specimen): Three Isles, north of Cape Bedford; 6.v.1929 (1 specimen): Yonge Reef (lat. 14°35′S.), eastern edge of Great Barrier Reef; 5.vi.1929 (1 specimen).

Distribution: Ranges widely in warmer seas of Indo-Pacific region, particularly where coral reefs occur – S. and E. Africa, Persian Gulf and Red Sea, Indian seas to southern Japan, Malay Archipel., W., N. and N.E. Australia, and eastwards through Polynesia to mid-Pacific.

Gonodactylus falcatus (Forskål)

Gonodactylus glabrous Brooks, 1886, p. 62, pl. xiv, fig. 5; pl. xv, figs. 7, 9: Kemp, 1913, p. 167, pl. ix, fig. 113, and text fig. 2 on p. 170 (syn. & earlier refs.).
Gonodactylus falcatus: Stephenson and McNeill, 1955, pp. 249, 257, 258, 261 (syn. & refs.).

Localities: General Survey – Low Isles; Mangrove Park; 28.iii.1929 (2 specimens): Stn. XII, dredge; Penguin Channel, between Snapper Is. and Cape Kimberley; 10–15½ fms; 24.ii.1929 (1 specimen): Low Isles and nearby Batt Reef; reef at low tide; no specific habitats (10 specimens).

Distribution: Ranges widely in warmer seas of Indo-Pacific region, mostly associated with coral reefs – E. Africa, Red Sea and Persian Gulf to Indian seas and southern Japan, Malay Archipel., Micronesia, W. and N.E. Australia, Lord Howe Is. in S. Pacific, and eastwards to Polynesia.

The species was the most common representative of its genus, and was found almost everywhere over the reef systems listed.

Genus *PROTOSQUILLA* Brooks, 1886

Protosquilla spinosissima (Pfeffer)

Gonodactylus spinosissimus: Kemp, 1913, pp. 11, 146, 191, pl. x, figs. 124, 125 (refs.); Serène, 1939, p. 347 (refs.); Holthuis, 1941, p. 292, fig. 9c (syn. & refs.).

Locality: Stn. XXV, dredge; Papuan Pass, eastern edge of Great Barrier Reef, east of Bloomfield River; 20–25 fms; 17.iii.1929 (1 specimen – total length approximately 19 mm).

Distribution: Red Sea, E. Africa, Ceylon to southern Japan, and N.E. Australia.

REMARKS: The generic name *Protosquilla* was earlier used for this species by Tattersall in 1906 (see Kemp, 1913). Now Holthuis (1964, p. 141), in considering the four "groups" as used by Kemp for the various forms of the species of *Gonodactylus* has proposed, for each of them, full generic rank. He thus uses *Protosquilla* for Kemp's group III, in which Kemp considered the species *spinosissima* should be accommodated.

This species, with its unmistakably characteristic telson, is recognized for the first time from Australian coastal waters.

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PLATES

PLATE 1

FIG. 1. *Polyonyx haigae* sp. n., holotype; male, carapace 6·1 mm wide, 5·3 mm long. Station V, trawl, 37 fms.

FIG. 2. *Pilodius espinosus* (Borradaile); male, carapace 14·5 mm between tips of lateral spines. Station XVII, dredge, 19 fms.

FIG. 3. *Pilodius espinosus*; female, carapace 16 mm between tips of lateral spines. Station XVII, dredge, 19 fms.

FIG. 4. *Pilodius espinosus*; male, ventral view of specimen in fig. 2.

FIG. 5. *Pilodius espinosus*; female, ventral view of specimen in fig. 3.

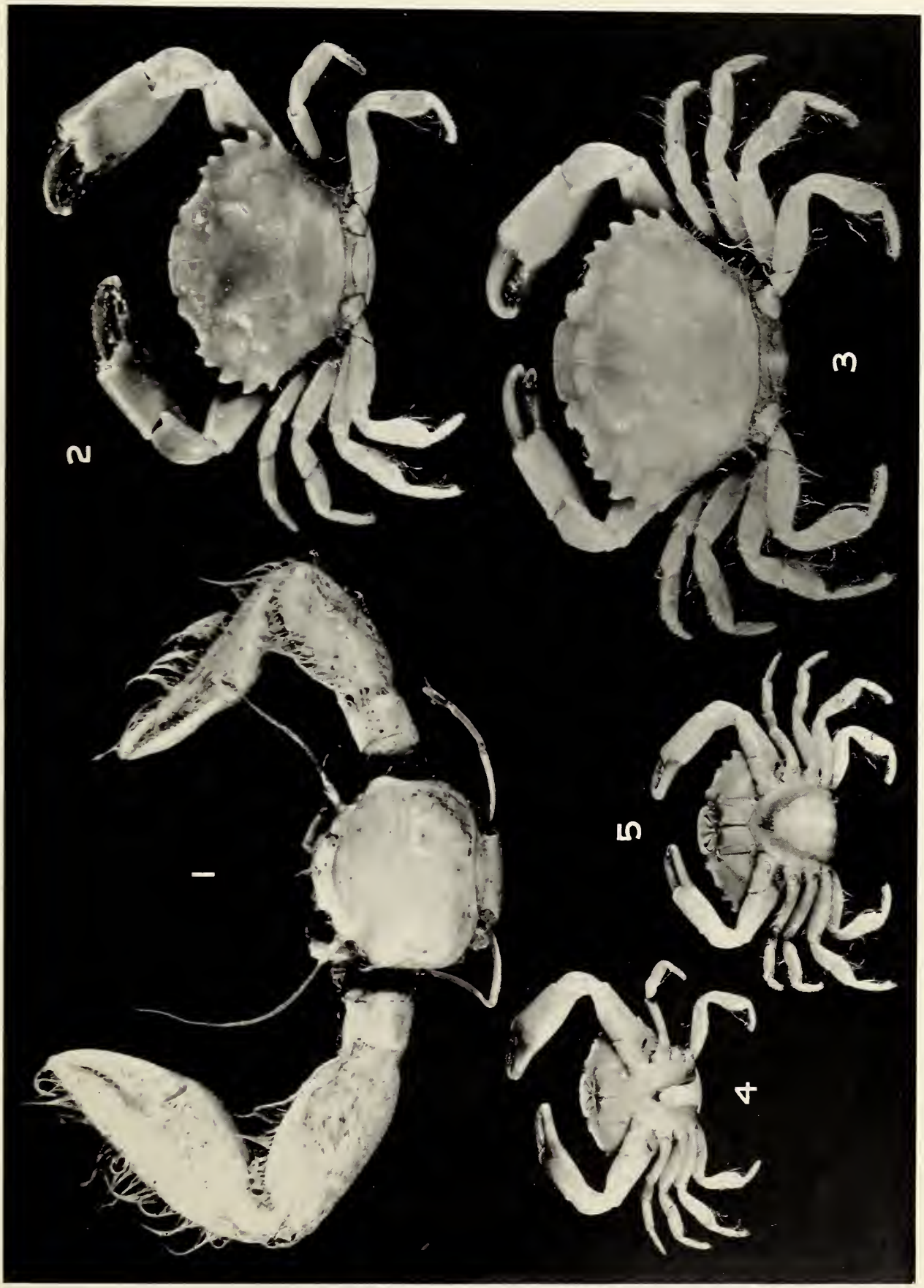
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PLATE 2

FIG. 1. *Heteropilumnus granulimanus* Ward; female, carapace 10 mm wide. Low Isles, Qld.

FIG. 2. *Macrophthalmus quadratus* A. Milne Edwards; male, carapace 11 mm wide. Brampton Is., Cumberland Group, Qld.; tidal sand flat (Aust. Mus. No. P. 12131 part). Note: the small dark area on right of carapace is due to damage.

FIG. 3. *Macrophthalmus quadratus*; male, ventral view of specimen in fig. 2.

FIG. 4. *Macrophthalmus quadratus*; female, carapace 10 mm wide. Same locality and Aust. Mus. No. as male specimen in fig. 2. Note: carapace is tilted forward slightly compared with fig. 2.

FIG. 5. *Palicus oahuensis* Rathbun; female, carapace 13 mm wide. Station XV, trawl, 210 fms. Photo: British Museum (N.H.).

FIG. 6. *Palicus oahuensis*; female, ventral view of specimen in fig. 5. Photo: British Museum (N.H.).